STEVENS CREEK: A PLAN OF OPPORTUNITIES

FINAL DRAFT

COMPREHENSIVE USE AND MANAGEMENT PLAN

SUBMITTED TO:

THE SANTA CLARA VALLEY WATER DISTRICT
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT
THE CITY OF MOUNTAIN VIEW

PREPARED BY:

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STEVENS CREEK: A PLAN OF OPPORTUNITIES

A Comprehensive Use and Management Plan for
Stevens Creek From San Francisco Bay
to Homestead Road

A Plan and Report Prepared for:

The Santa Clara Valley Water District
The City of Mountain View
The Midpeninsula Regional Open Space District

BY THE PLANNING COLLABORATIVE INC.
SAN FRANCISCO, CALIFORNIA

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THE NEED FOR A PLAN

THE NEED FOR A PLAN

The Creek's Resources and Problems

As one of the three major remaining streamside open spaces of Santa Clara County, Stevens Creek is a highly valued, environmentally important urban natural area. The stream landscape offers a variety of environmental, visual, cultural, and recreational features to urban residents desiring close-to-home recreational opportunities.

The stately trees of the creek are its most conspicuous asset. Towering cottonwoods, sycamores, oaks, and alders provide an abundant natural area in the midst of the city. Although obscured from some vantage points, the creek provides a prominent visual backdrop to the city. Its refreshing scenic qualities are enjoyed by travelers along Stevens Creek Freeway. The creek offers tangible evidence of man's relationship with his natural environment. A total of 42 schools are located within two miles of the creek, permitting use as an environmental education resource.

Upon close inspection, the problems of the creek become apparent. Large portions of the stream landscape are severly deteriorated. Man's use and abuse of the natural area have left one kind of scar; the erosive nature of the creek has left another. Missing is riparian woodland continuity throughout the reaches. The health and vigor of many trees as well as the habitat potential have been seriously undermined. Much of the understory vegetation which nurtures the ground below the woodlands and holds the soil is missing or disturbed. Steelhead trout no longer make their winter runs up the creek from the bay to spawn. Increasing instability of the creek bank threatens property in some areas, flooding threatens others. Unplanned, unmanaged use of the creek often creates conflicts with private adjoining residences and causes police and fire problems as well as detrimental impacts in environmentally fragile areas.

The lack of clear sense of purpose, a physical plan for its use, and a management program prevents realization of the creek's full potential and service to surrounding

communities. Without a coordinated view of the future, these potential opportunities may erode further and be lost to future generations.

History of the Park Chain Concept

The County of Santa Clara, in 1961, proposed the Stevens Creek Park Chain concept as a means of preserving the linear stream open spaces through the highly populated cities of Mountain View, Sunnyvale, Los Altos, and Cupertino. The opportunity to link mountain recreation areas to the large marine parks proposed for the margin of the South Bay offered rich public benefits: "Parks tied together along the stream side park chain will be of maximum benefit to the crowded urban population expected to live on the valley floor in future years." Although construction of the Stevens Creek Freeway paralleling the creek was anticipated in the early plan, subsequent development of the freeway, and other encroachments have reduced and constrained the open space lands depicted in the early scheme. Nonetheless, many of the original goals are still within reach today.

Impact of Past Uses

Native American Indians, Spanish explorers, and early farmers and settlers relied on the resources of the creek. Yet, the pockets of natural richness and abundance which remain today are mere remnants of the vast woodlands which thrived in the past. Large-scale agriculture moved into the Santa Clara Valley, destroying the oaks in the valley. Subsequent urbanization encroached upon the riparian corridor. Structures were built close to the creek bank; bridges and other urban improvements reduced the remaining woodland stands. Power transmission lines took advantage of the direct routing through the urban area offered by the stream course. Freeway construction disrupted topography, disturbed natural areas, created an effective barrier limiting neighborhood access to open space and left behind land parcels of varied size and use potential. The construction of extensive levees, creek channelization, and structural lining of the creek bed and bank have altered the natural appearance and reduce habitat productivity.

The Remaining Opportunity and Need

The key element of the natural stream corridor, however, still exist. The remaining open lands of the creek (including miscellaneous parcels of public lands, rights of way for power lines,water district maintenance roadways, parks and school grounds) constitute land resource opportunities now more than ever of vital interest to the urban community.

Today the impetus for planning results from the need to address pressing flood control and erosion protection needs. The immediate opportunity is to organize these urgently needed physical improvements and management requirements within a planning framework which allows recreational and environmental objectives to be identified, priorities to be set among desired uses, and multiple objectives to be achieved consistent with the efficient expenditure of public funds. In addition to assessing flooding and property damages resulting from the one percent flood, this study evaluates creek channel erosion and hazard problems and recommends mitigation measures and management programs. The recommendations attempt to respond as well to the full range of community opportunities, integrating desired public facilities, programs and recreation potential. The resulting management program must be flexible and comprehensive if current public expectations for the creek way are to be realized.

Combined governmental efforts, as envisioned in the original Stevens Creek Park Chain concept, need to be exercised to fulfill community recreational needs. The current uncertainty over the capability of local and state governments to provide customary services and amenities calls for the creative utilization of a variety of available but less well-known measures. The challenge exists for broad-based and innovative community involvement.

Just as it takes time to grow the trees for our future urban woodlands, a plan of community desires will need time to be refined and implemented. The concept of a viable urban natural area and park corridor is at a critical crossroads; the time for

agreement on a common philosophy, a physical plan, and a shared management approach has come.

The Study Approach

This comprehensive management and multi-use study of Stevens Creek from Homestead Road to the Bay undertook detailed assessments of the environmental and urban conditions. The guidance of local residents and representatives of the user public was critical in formulating the planning and management recommendations of the report. A program of field studies and interdisciplinary assessments of flooding and erosion problems, biotic resources conditions, and urban recreational opportunities was systematically undertaken. Public agencies, neighborhood citizens, and other groups including business and utility companies were encouragaed to participate in the study. Public participation was formally organized around a series of public workshops held in neighborhood areas along the creek. Although direct person-to-person contact was stressed in this process, supplemental citizen input was gained from direct-mail requests for input from representatives of various groups.

The guiding intent of the study was to accommodate uses which are not disruptive to local property owners and which coordinate and confrom to needs for flood and erosion protection, recreation, land development and traffic regulation. The result is a set of goals, specific policies and detailed physical plan recommendations which directly reflects the statements of concern received from public bodies, residents of creek neighborhoods, and representatives of user groups. A critical phase of the planning process has been to forge a plan which mediates conflict between individual public groups while preserving future possibilities and identifying innovative solutions. In addition, the ongoing nature of the planning process has been incorporated into the study approach so that options out of reach today may be preserved for later preserved for later phases.

PLAN BASIS: CONCEPTS, GOALS AND POLICIES

PLAN BASIS: CONCEPTS, GOALS, AND POLICIES

(This section is to be coordinated with graphic material)

Basic Principles

To be implementable, a plan needs an internally consistent framework of community goals, policies, management guidelines, and programs to carry out detailed decision-making. The underlying concepts and premises of the plan must be broadly understood by the public and by coordinated governmental entities. A recommended plan must also be seen in light of its fit with the plans of others: in terms of those preceding plans it revises, current plans it complements, and future plans it fosters.

The intent of this chapter is to summarize the concepts, goals, and policies which form the framework of the recommended plan. Planning concepts which organize the physical plan, the environmental principles which provide for orderly restoration of the natural area, and the plan development process whereby the "resource-oriented" management program and "people-oriented" use program may be adjusted over the long term are illustrated. The plans of others are briefly reviewed as background to the Summary of Recommended Goals and Policies.

The Resource Chain: Reaches-Nodes-Parklets

The creekway may be managed according to a system of stream reaches, area nodes, and parklets. This hierarchy provides order by defining creek segments according to specific environmental conditions and characteristics of the adjacent urban setting. Recreational roles may also be scaled to the hierarchy of resource areas.

Reaches

Uniform creek segments or links provide logical subarea planning units within the corridor. Plan and management program recommendations are organized by reach.

Nodes

Nodes represents distinguishable major areas within a reach where a "people-oriented" or "resource-oriented" park land may be designated. Nodes represent areas where activities are to be clustered or where a unifying resource theme is recommended.

Parklets

Small close-at-hand green places which should be avilable on a neighborhood basis to allow the environment to be experienced daily.

Recreational Roles

Regional and City-Wide Roles

Large-scale environmental and recreational resources within the creek resource chain are capable of serving a broad geographical population area without imposing conflicts on more local levels of use.

Community Roles

Medium-sized areas provide levels of use scaled to the available resources in a form serving and identified with the local community.

Neighborhood and Micro-Neighborhood Roles

The smallest unit of use within the creek system occurs where creek resources best serve the immediate urban area on a scale of use consistent with available access, adjacent land uses, and the environmental sensitivity of the creek segment.

Restoring the Resource Base

Reversal of the deterioration of land, water and vegetation resources of the creek requires an orderly progression of improvements and management measures. Systematic design with nature to retrain natural processes toward desirable management goals and to check destructive forces can be achieved by repairing and improving the morphology of the creekway, reshaping surrounding land forms where severe erosion or destabilization has occurred, and undertaking revegetation measures.

Methods for Creekway Repair

1. Reshape the streambed to form shallow riffle areas in selected reaches to manage stream flows and enhance aquatic habitat productivity.

2. Arrest creek bank undermining and erosion problem areas.

Bank and Landform Improvement

1. Re-contour barren errosion-damaged creek banks to remove unstable areas and achieve gently sloping bnaks where appropriate.

2. Protect other fragile banks from erosion by structural armoring where critical.

3. Control future undermining on an as-needed basis with rock rip-rap.

Revegetation

1. Conserve and restore the riparian woodland along the creekway.

2. Plant new oak woodlands on the adjoining open creek terraces.

Plans of Others

The interjurisdictional context of Stevens Creek requires that plans of other governmental entities be considered in the planning process. Relevant past and current plans are summarized below as they regard the Stevens Creek plan.

Mountain View General Plan

The 1973 Open Space and Conservation Element of the General Plan supported the development of a continuous park and open space chain along Stevens Creek from Stevens Creek Freeway to the Bay. Approximately fifty acres of city-owned land were designated as the Stevens Creek Park Chain. The Bikeways section of the 1972 Circulation Element, proposes a bicycle path network along major roadways and along Stevens Creek.

North Bayshore Area Plan

The plan, approved in 1977 by the Mountain View City Council, proposes a continuous public park strip along the PG&E easement at Stevens Creek from Shoreline Regional Park to US 101. Recommendations for future land use and circulation conform to the Mountain View Open Space and Circulation Elements.

Cupertino General Plan

The Open Space and Conservation element adopted in 1972 recommends acquisition by the city of properties in the Stevens Creek floodplain and urges cooperation with the county in the development and completion of the Stevens Creek Park chain facilities.

Sunnyvale General Plan

The 1972 General Plan indicated non-intensive conservation uses for the baylands and the greenway along Stevens Creek. Coordination with the Santa Clara Valley Water District and the City of Mountain View in development of the parklands is proposed.

Los Altos General Plan

The Open Space and Conservation Element of the General Plan proposes a creekside trail linking community and regional parks the length of Stevens Creek as it flows through the City of Los Altos. The design concept appeared twenty years ago in the first Los Altos General Plan which recommended broad greenbelts along both Stevens and Adobe Creeks. The current General Plan recommends a joint study be undertaken by Los Altos, Sunnyvale, and Cupertino to determine the extent of future park and trial development.

Santa Clara County General Plan

The 1972 Plan of Regional Parks for Santa Clara County designates development of a streamside park chain along Stevens Creek from the reservoir to the baylands. As part of the continuing update program of the County Plan, the Trails and Pathways Subcommittee of the County Planning Policy Committee has formulated a detailed trail plan for the county which designates a regional trail component for the Stevens Creek Corridor and the Bayshore. Before this time, the County had adopted the Stevens Creek Park Chain proposal in 1961.

Shoreline Regional Park

A 544 acre regional shoreline park (originally designed in 1968) is planned for the sanitary landfill site on the Mountain View bayfront. The City of Mountain View is currently working on a phased development program for the park as the landfill reaches capacity.

Stevens Creek Shoreline Nature Study Area

The Midpeninsula Regional Open Space District was awarded a $208,000 Land and Water Conservation Fund grant for the purchase of a proposed nature study area along Stevens Creek. The 54-acre site is the last accessible piece of tidal marshland and mudflat in the Mountain View-Sunnyvale areas and is directely across the creek from the Mountain View Shoreline Regional Park. Anticipated use is an enviromental education program similar to the Palo Alto Baylands Interpretive Center.

Planning Study for Stevens Creek

The 1974 Santa Clara Valley Water District Planning Study addressed flooding and erosion problems between Central Avenue in Mountain View and the Stevens Creek Dam. Recommendations included a future study to consider and coordinate multi-use programs for the Stevens Creek Park Chain from Homestead Avenue to the Bay.

Baylands Salt Water Flood Control Planning Study

The Water District commissioned a study in 1973 to identify lands to be protected from salt water flooding and to consider flood control alternatives in the south bay area. The report considered four alternatives: A) A Do Nothing Plan, B) An Outboard Dike System at the bay edge, C) An Inboard Dike System on the landward side of the salt ponds, and D) An Inboard System with creek dikes out to the bay. Further consideration of these options and formulation of a final plan awaits an in-depth engineering study by the U. S. Corps of Engineers.

San Francisco Bay National Wildlife Refuge

In 1972 Congress established the San Francisco Bay National Wildlife Refuge as part of the Naitonal Wildlife Refuge System. The refuge incorporates roughly 23,000 acres, encompassing salt ponds and wetland areas in the Santa Clara County Baylands east of Guadalupe Slough. The purpose is to ensure the protection of wildlife habitat and to develop opportunities for wildlife-oriented recreation and environmental education.

BCDC Public Access Plan

A recently formulated Bay Conservation and Development Commission policy plan for public access to the shoreline within the south bay communities sets forth habitat conservation, recreational use and trailway policies. "Point" type access to the shoreline is recommended along Stevens Creek for pedestrian and bicycle trail users.

Recommended Goals and Policies Summary

The following recommended goals and policies are intended to direct the implementation of the plan over the long-term by providing statements of purpose, intention and direction. While the list of these is long, it is anticipated that they will be refined as time goes on. The goals and policies separate naturally according to the respective agencies responsible for them. These have been shown in the table on page 30.

Goals Summary

The broad goals set forth below serve as a basis for the more specific policies which follow.

1. Natural resources conservation and management goal.

The Stevens Creek corridor is a valuable natural resource of the urban community and should be conserved, restored, and managed as an urban natural area compatible with flood control needs.

2. Flood and erosion damage reduction goal.

Provide a feasible level of flood protection and erosion control in keeping with the environmental and recreational attributes of the creek open space corridor.

3. Recreational resources and use goal.

The Stevens Creek corridor is a valuable open space recreational resource of the urban community and could ultimately be used for a wide variety of close-to-home recreational opportunities serving local and regional needs in keeping with environmental attributes, flood damage reduction needs, and land uses adjoining the open space.

4. Community environment goal.

Establish a compatible relationship between the urban community environment and the natural area which fosters the community use, enjoyment, and conservation of the urban natural area.

5. Plan and program implementation goal.

Provide for the long-term coordination of the continuing planning, financing, development, and management of the comprehensive use and management plan and program for the Stevens Creek Corridor.

Natural Resources Conservation and Management

Major Goal.

The Stevens Creek Corridor is a valuable natural resource of the urban community and should be conserved, restored, and managed as an urban natural area.

Conservation of Existing Natural Resources Policy.

Conserve and protect the natural elements and ecology of the Stevens Creek Corridor.

Management Guidelines.

Existing Woodland Retention. Retain and protect existing woodland areas of native trees and vegetative understory from further non-open space development encroachment and adverse impacts of maintenance, recreation,

and similar activities except where acceptable uses, adequate impact mitigations, or natural area recreation programs are planned.

Riparian Trees Protection. To the extent possible, protect mature riparian trees undergoing erosion and other causes of tree loss.

Marshland Conservation. Retain existing saltwater marshlands and mudflats at the Bay margin and conserve or replace,where necessary, "in-channel" saltwater and freshwater marshlands.

Wildlife and Birdlife Sanctuary. Provide wildlife sanctuary from hunting. Within the baylands portions of the creek, a 1000 yard hunting buffer shall be promoted, and hunting shall be prohibited from the area immediately within and adjacent to the creek.

Pedestrian Use of Fragile Streambanks. Discourage indiscriminate pedestrian use of steep, fragile streambank areas where disturbed vegetative understory, erosion, and bank instability are present; provide structural footpaths to redirect use as appropriate.

Liquid Waste Discharges. Prohibit the discharge of petro-chemicals, industrial wastes, and other toxic contaminants into the creek corridor.

Removal of Eucalyptus Trees. Eucalyptus trees mixed with native woodlands should be removed when they die and replaced with native woodland tree types. Native woodland tree types include cottonwoods, sycamores, oaks and alders.

Dumping Prohibition. All dumping of solid wastes should be prohibited. Dumping of debris and garden cuttings by residents adjoining the creek should be discouraged by a public information program.

Motorcycles and Off-Road Vehicles. Prohibit the use of the creekway open lands by motorcycles and private off-road vehicles which are destructive to vegetation, soil condition and stability.

Natural Area Restoration Policy

Enhance and rehabilitate the natural landscape of the creek corridor through an ecologically-based restoration program.

Management Guidelines

Riparian Woodland Restoration. The riparian woodland plant community associated with the creekway should be restored to increase the linear continuity, lateral width, and plant form density.

Oak Woodland Restoration. New oak woodlands should be planted on the valley flatlands adjoining the creekway to replicate the extensive oak forests which once dominated the Santa Clara Valley.

Meadow Area Restoration. Meadows of grasslands and wildflowers should be established within oak woodland areas to achieve an overall pattern of wooded and open spaces.

Marshland Restoration. Saltwater and freshwater marshlands should be restored and expanded, especially where opportunities within the creek channel may be developed.

Stevens Creek Expressway Native Plant Landscaping. Establish an oak woodland native plant landscaping program along the Stevens Creek Freeway right of way and intersection islands to visually expand and environmentally reinforce the wooded appearance and character of the creek corridor.

Peripheral Lands Native Plant Landscaping. Undertake a native plant program in intervening street rights of way, school grounds, and other public open lands, to enhance and expand the creek corridor's natural appearance and ensure the future open space.

Wildlife Improvement and Management Policy

Promote healthy terrestrial wildlife conditions within the Stevens Creek Corridor and achieve workable levels of wildlife diversity which can be enjoyed by the urban community.

Management Guidelines

Wildlife Corridor Continuity. Retain a continuous, open creek corridor from the foothills to the Bay to permit wildlife migration between the reaches of the creek.

Habitat Corridor Water Availability. To the extent possible, retain the water and stream flow in portions of the creek on a year-round, long term basis to retain the water-dependent wildlife species within the corridor and reduce the fluctuations in wildlife populations.

Riparian Plant Associations. Restore and maintain natural riparian plant associations in all reaches of the creek to improve creek-related terrestrial habitat and increase bird life.

Downed Wood. Whenever possible, leave dead trees outside the channel in place to encourage hole-nesting birds and mammals. Fallen trees and downed wood should be left on the ground to decay and provide the cornerstone habitat of invertebrate animals, amphibians, reptiles, rodents, and insectivores.

Aquatic Habitat Improvement and Management Policy

Improve and enhance creekway habitat by restoring Stevens Creek as an anadromous fish spawining and nursery habitat below Stevens Creek Dam and promoting future development of off-stream recreational fishing ponds adjacent to the creek.

Management Guidlelines

Anadromous Fish Barriers. Eliminate or mitigate existing barriers prohibiting upstream fish passage and mitigate future barriers resulting from new structures built in the creek with fish ladders, resting pools, baffles, and other such techniques.

Estuarine Anadromous Fish Holding Area. Promote development of a levee design within the estuary portions of Stevens Creek which permits a channel

configuration allowing for a series of holding ponds or forebays capable of permitting acclimatization of anadromous fish to upstream fresh water.

Nursery Fishery Management. Manage the creekway as a nursery fishery in the stream reaches above El Camino Real on an integrated basis with the in-stream groundwater percolation program and an appropriate public use program.

Anadromous Fish Restocking. Support an anadromous fish restocking program with preference for utilization of eggs from San Francisquito Creek to maintain consistency of environment and species in the stocking program.

Creekbed Enhancement. Enhance the spawning and nursery habitat and gravelly stream bottom in selected areas by reshaping the streambed to form oxbow-type pools and broad shallow riffle areas where shade exists.

Streamflow Regulation. To the extent possible, regulate stream flow releases of Stevens Creek Dam to promote adequate water movement and minimum year-round depths within the managed anadromous fish nursery habitat as consistent with the instream groundwater percolation program.

Riparian Vegetation. Enhance and restore riparian vegetation on a priority basis in the spawning and nursery habitat areas of the creek to stabilize water temperatures and encourage stream food organisms.

Stream Turbidity, Sediment and Siltation. Increased stream turbidity, stream-borne sediment and siltation of the gravel streambed from excessive bank erosion, inappropriate grading in adjacent areas, erosion induced at storm drain outfalls and excessive open land grading within the watershed should be prevented or minimized to maintain the quality of the aquatic habitat and reduce downstream siltation problems.

Off-Stream Recreational Pond and Fishery. Develop artificial off-stream fishing ponds of sufficient surface water area and depth to support trout and warm water species of game including sun fishes, blue gill, bass, and catfish.

Bayshore Recreational Fishing Opportunities. Encourage development of facilities within the tidal portion of the stream channel to permit recreational fishing for bay fishes.

Flood Protection and Erosion Control

Major Goal

Provide a feasible level of flood protection and erosion control in keeping with the environmental and recreational attributes of the creek open space corridor.

Flood Protection Policy

Provide flood protection from the one percent flood in a manner which maintains and enhances environmental resources and promotes recreational benefits

Management Guidelines

Flood Prone Area Protection. Provide adequate protection from the one percent flood in the identified flood prone areas: a) between Dana Avenue and the SPRR Bridge just south of Central Expressway where flood waters are projected to spread into major portions of the urban area to the west of the creek; b) in the vicinity of Moffett Field Naval Air Station east of the creek and north of Bayshore Freeway; and c) on the west side of the creek between Bayshore Freeway and the south end of the Shoreline Park.

Salt Evaporation Ponds Flood Protection. Future flood protection of the salt evaporation ponds of Leslie Salt, Inc. shall be assessed in conjunction with a further study of saltwater flooding and the need for coordinated flood protection improvements. Should flood protection be provided, a balanced and integrated program of increased environmental and recreational benefits should be achieved.

Recreational Use of Flood Control Improvements. Promote the recreational use of flood control protection measures by providing facility designs which integrate recreational uses, including trails within levees, pedestrian passage

downstream banks and over streams, and by cooperating in public recreational use programs.

Revegetation Related to Flood Control Improvements. Revegetation consistent with the natural vegetation and woodland restoration policies should be provided as a related component of flood control protection measures.

Anadromous Fish Passage Mitigation Measures. Where flood control measures may potentially hinder andromous fish passage by creating barriers and excessive stream flow velocities, mitigations shall be incorporated into their design, such as fish ladders and resting pools to insure future fish migration.

Shoreline Park In-Channel Environmental Enhancement. Provide for a channel configuration and levee design in the Shoreline Park vicinity of the creekway which: 1) encloses the marshland restoration portions of Shoreline Park and the Midpeninsula Regional Open Space District's dedicated marshland area within the channel; b) allows for a broad marshland restoration area which would be subject to natural tidal and stream flow influences; and c) forms a major environmental feature of both the creek corridor and Shoreline Park.

Erosion Control Policy

Improve creek channel stability, the safety of life and property from erosion-related hazards, and reduce deleterious effects of instream sediment processes through a balanced program of structural and non-structural erosion control and hazard protection measures compatible with environmental and recreational resources.

Management Guidelines

Geologic Hazard Setback Line. Geologic Hazard Setbak Lines identify areas which are potentially subject to ground failure and slope instability due to erosion of the creek channel or ground shaking during an earthquake. New development shall be prohibited within the Geologic Hazard Setback Line. Existing land uses and buildings within the setback line shall be permitted to continue according to their present use.

Erosion Mitigation Measures. Because of the magnitude of creek bank instability problems in many portions of the creekway, the high cost and impracticality of structural solutions, and a desire to retain the natural attributes and appearance of the creek channel, the Water District shall promote use of land use controls and erosion minimization techniques. In selected areas, structural solution, including sacked concrete, rock gabion, and concrete lining techniques, shall be employed.

Multi-Purpose Design of Structural Measures. Structural measures of erosion protection and reduction shall be designed to provide maintenance access, pedestrian access for recreational purposes, vegetation enhancement, improvement of the aquatic environment and appearance, or permit migration of anadromous fish, where appropriate.

Vegetative Erosion Control Measures. Encourage use of vegetative measures of erosion control where structural measures are inappropriate, infeasible,or bank conditions warrant.

Irrigation. Irrigation of Public Lands within the Geologic Hazard Setback Line shall be discontinued and avoided where new landscaping is planned, to reduce the effects of water-induced instability in creek bank areas. Homeowners shall be advised of the adverse effects of irrigation in potentially unstable creek bank areas.

Recreational Resources and Use

Major Goal

The Stevens Creek Corridor is a valuable open space recreational resource of the urban community and should be used for a wide variety of close-to-home recreational opportunities serving local and regional needs in keeping with the environmental attributes of the corridor and as compatible with land uses adjoining the open space.

Park Chain Development Policy

The open spaces of the Stevens Creek Corridor shall be developed as a continuous chain of parklands within which major recreational use areas and supporting facilities (public parking, restrooms, etc.) are clustered at planned locations for ease of management. Park chain recreational resources shall augment and provide a framework for regional, urban, and neighborhood park and recreational activities.

Outdoor Recreation Use Policy

Outdoor activities which are compatible with the natural environment and insure the conservation and enchancement of the area open spaces shall be emphasized.

Management Guidelines

Near Term Recreational Development. During the initial phases of open space recreational resource development, emphasis shall be placed upon improvement of the vegetational resources, landform, and creek area modifications related to environmental and recreation objectives, and recreational activities which have low requirements for supporting facilities, excepting trailways, their appurtenant facilities, natural interpretive facilities and displays, exercise courses, and the like.

Long Term Recreational Development Potential. Other recreational and community activities requiring more intensive facilities may be developed over the long term as community needs and demands require, including such activities as group picnicking facilities, group assembly facilities, a model

farm and horticulture center, a cultural awareness center, structured and unstructured field game areas, and the like.

Public Use and Access. Public use and access to the open space recreational resources of the corridor shall vary according to environmental and recreational program objectives and consideration of neighborhood compatibility. Public use and access shall include open access areas as well as restricted use areas where use by designated groups is emphasized.

Integrated Development of Recreational Facilities. Site planning and development of recreational facilities shall emphasize integration with existing public facilities including parks and school areas, as well as multi-purpose design of bridges, flood and erosion control structures, and similar public improvements, including terracing.

Public Safety. All detailed site planning and facilities design shall consider and provide for public safety.

Stevens Creek Bay to Mountains Trailway Policy

Designated portions of the Stevens Creek corridor may be used for a continuous trail extending from the Baylands to Stevens Creek Park. The continuous improved trail portion within the corridor shall occur from Brooks Place in the City of Mountain View to the baywaters as designated. Alternate routes outside the corridor shall be as designated by the County trails and pathways plan.

Management Guidelines

Local Trail and Bikeway Connection. The design of hiking trails and bikeways within the Stevens Creek Corridor shall provide for connection to local trails: the Ivan Way, Levin Avenue, Senmar Avenue, Eunis Avenue bikelane; the west Dana Street bikelane; the Central Expressway bikelane; the Middlefield Road bike route, and the Charleston Road proposed bikeway.

Baylands Regional Trails Connection. Provide for connection of the Stevens Creek Trailway to the baylands trail system on the inboard levee linking Shoreline Park to the Midpeninsula Regional Open Space District marsh preserve via a bridge over the creek channel as designated.

Phasing of Pedestrian and Bikeways. Promote early development of improved bikeways which facilitate commute-to-work trips, particularly in the Middlefield Road area, and for pedestrian and bikeways which facilitate school children travel to area schools.

Trailway and Bikeway Support Facilities. Trail heads or staging areas for trailway use and facilities for rest stops serving the hiking and bikeways along the corridor should be provided at the proposed Shoreline Park Interpretative Center, Whisman School, Landels School, and at future public developments in the El Camino Real area.

Trail Use. In the bayland portions of the trailway, from the proposed Charleston Avenue overpass of Stevens Creek to the Shoreline, the improved trailway shall provide for hiking, biking, and equestrian use within a trail design which segregates each mode of travel. In all upper reaches of the trailway, from the proposed Charleston Avenue overpass to Brook Place, the improved trail facilities shall provide for bikeway and hiking trail only, within a facility design which segregates the two activities.

Barriers Crossing. Trail crossings or undercrossings of major barriers disrupting easy and safe passage along the creek trailway shall be provided: a pedestrian overpass over U. S. Highway 101; a separated trail undercrossing at Stevens Creek Freeway between Central Expressway and the Southern Pacific Railroad; a creek trail bypass in the vicinity of the Mountain View Alviso Freeway and El Camino Real.

Neighborhood Jogging System. Establish a system of designated measured jogging routes between neighborhoods adjoining reaches of the creek and the natural area.

Nature Study. Promote greater community awareness of the natural resources, opportunities for nature studies, and encourage a coordinated program of nature study use for local community groups such as schools, scouting groups, senior citizens groups, and conservation groups.

Baylands Interpretive Center and Boardwalk Facilities. Develop a baylands interpretive center in a location which facilitates linkage of Shoreline Park to Stevens Creek and the Midpeninsula Regional Open Space District marshland preserve and promotes related development of interpretive boardwalk facilities. The interpretive center should include natural history, habitat, and ecological displays, and information center, small auditorium, lounge area, restrooms, storage and maintenance areas, outdoor decks and use areas. Raised boardwalk and walkway facilities and deck viewing platforms should be sited according to significant habitat vantage points.

Interpretive Features Displays. Develop an interpretive information system at various points of significant geologic, hydrologic, biotic resource or historical features utilizing appropriate information board plaques.

Compatible Construction Materials. All facilities and structures constructed within the creek corridor should be of natural materials, or effect a natural appearance.

Off-Stream Recreational Fishing Pond. Support the development and management of artificial off-stream fishing ponds within the creek corridor for year-round recreational use. Where the use exceeds the capacity of pond fishery, an alternative "catch and release" (barbless) system might be considered or there may be established the means to provide a "put and take" type recreational fishery.

Bayshore Recreational Fishing Opportunities. Encourage future development of sufficient facilities such as seasonal stop log weirs, fishing piers, and platforms within the tidal portion of the stream channel to permit recreational fishing for bay species. In the future, explore the desirability and feasibility of a fishing pier or platform extending into the baywaters.

Conservation Group Bay Use and Land Management Area. Establish a land management and resource restoration area permitting development of group day-use activities, controlled access and management by a designated group or club such as Boy Scouts, Girl Scouts, Campfire Girls, 4-H Club, etc.

Public Day-Use Facility Development. Promote the development of family picnicking sites, structured and unstructured field play areas at designated locations adjoining the creek natural area.

Community Environment

Major Goal

Establish a compatible relationship between the urban community environment and the natural area which fosters the community use, enjoyment, and conservation of the urban natural area.

Land Use Policy

Existing and future land uses adjoining the creek should promote and maintain the highest degree of compatibility with the open spaces of the creek.

Management Guidelines

Stevens Creek Corridor Open Space Framework. Utilize the Stevens Creek Corridor as an organizing framework of open space for the urban land uses adjoining the creek.

General Plan Urban Design. Urban design policies and actions proposed in the general plans of adjoining cities shall promote open space values by providing visual orientation within the community, visual linkage of street

planting programs, enhancement of view corridors along major traffic ways, care in the siting and scaling of major buildings, and enhancement of the continuity of related pedestrian and bicycle systems linking to the creek corridor.

Transportation System. Utilize the creek corridor where appropriate to unify and complete the local bicycle route network and improve alternative transportation modes by providing commuter bike routes as links between residential areas and mass transit stations.

Existing Land Uses. Adjacent land uses shall respect open space character by removing visual barriers and blights such as outdoor storage areas, unkept fences and spaces, and by reorienting social spaces and use areas including play areas, employee gardens, rest and luncheon spaces, recreation spaces, public entrances and walkways, and landscape improvements.

New Land Use Development. New development, redevelopment, or land use conversion adjacent to the creek shall be designed and developed to take advantage of the creek frontage landscape amenity, shall orient use to the creekway open space, restore native vegetation and provide public access where appropriate. Where practical, new streets shall be aligned parallel to the creek to separate homes and yards from the creek.

El Camino Area New Land Development. Future recreational development in the El Camino Area shall consider dedication of lands for park development and public access, and the interrelationship of new residential and commercial development to future open space lands.

Baylands Area New Land Use Development. New development in the North Bayshore area shall complement Shoreline Park and the Stevens Creek open space corridor. Landscaping shall be consistent with the native plant landscaping program and building shall be designed and sited to promote park orientation.

High Density Residential Area Access. High density residential areas adjoining the creek shall provide pedestrian access to the parkland via a pedestrian overpass at the Dale Avenue/Heatherstone Way area, additional trails on a needs-demands basis, and establish parking areas at key access points.

Circulation System Conflicts and Safety. Promote an efficient and safe circulation system with minimum conflicts between vehicular, bicycle, and equestrian modes of travel by insuring safe vehicular access from public use areas, avoiding mid-block crossings of bike and pedestrian systems, and maintaining segregation of mode types.

School, Environmental Education and Use Program. Encourage local schools to develop environmental education programs utilizing creek resources for outdoor classroom and nature study purposes; promote a cooperative program of stewardship and management of these resources.

Visual Barriers. Remove chain link fences and other visual barriers between major public use areas and the natural area. Maintenance roads shall be designed and maintained to create the least possible visual impact.

New Crossing Roads and Utilities. The proposed secondary access route to the NASA-AMES facility in the baylands should include provisions to maintain the creekway trail, provide maintenance vehicle access and landscaping to enhance the creek's natural appearance. Future utility alignments including powerline support towers should take advantage of existing bridges and roadway crossings. Where new crossings are necessary, they should be designed to provide environmental, scenic and recreational benefits.

Stevens Creek Signage System. A signage system should be developed to identify key areas and circulation routes throughout the Stevens Creek urban natural areas.

Cultural Resources Policy

Promote community awareness of the cultural resources of the Stevens Creek Corridor and conserve any historic and prehistoric materials which may be present.

Management Guidelines

Cultural Resources Themes. Utilize historical themes of tribal, Spanish, and early settler history of the creek corridor and Santa Clara Valley in the programming of major public recreational use areas.

Pre-Project Determination of On-Site Archeological Material. Earth-moving activities should be monitored by a qualified archeologist. Should significant materials be uncovered, construction should be stopped until such time as plans for the preservation or removal of artifacts can be made in concurrence with members of the Ohlone tribe or representatives of the Northwestern Indians Cemetary Protection Association.

Acoustical Environment Policy

Reduce the noise levels emanating from highway sources to a level of quite appropriate to the natural area of the Stevens Creek Corridor.

Management Guidelines

Desirable Noise Environment. In order to enhance the use of the Stevens Creek open space for nature study, quiet walks, contemplations, and relaxation, a maximum sound level of 55 dB(A) should be sought within its open space corridor.

Earth Work Noise Barriers. Wherever major earthwork is planned within the Stevens Creek Corridor, excess fill materials should be deployed to form a planted earth berm to protect interior spaces of the natural area from noise generated by adjacent freeways.

Coordination of Noise Mitigation. Where opportunities are present to develop barriers which will reduce noise impacts in both open space areas

and neighboring residential areas, a coordinated mitigation program should be sought.

Plan and Program Implementation

Major Goal

Provide for the long-term coordination of the continuing planning, financing, development, and management of the comprehensive use and management plan and program for the Stevens Creek Corridor.

Plan Adoption Policy

Adopt the long-term physical plan together with the goals, objective, policies, and accompanying optional area plans as a guide to community and agency decision-making.

Intergovernmental Coordination and Lead Agency Policy

Adopt and maintain an organized plan of intergovernmental coordination under the lead of the Water District with specific policy and program policy responsibilities assigned to Key entities according to the level of community service provided by each subarea of the corridor.

Near-Term Improvements Implementation Policy

Implement near-term improvements by taking advantage of the existing project programs and committed planning programs of related entities while fostering a high level of community involvement improvements program.

Improvement Program Phasing Policy

Phase specific improvements incrementally with continuing planning coordination.

Management Guidelines

Key Agency Coordination Agreements. Provide for management cooperation and coordination agreements between the Water District, Midpeninsula Regional Open Space District, Santa Clara County Parks and Recreation Department, and Cities of Mountain View, Sunnyvale, Cupertino, and Los Altos, to facilitate continued cooperation and coordination between key agencies.

School Nature Study Program Coordination. Promote joint program development efforts among area School Districts to coordinate and share in nature study curricula, outdoor classroom use, funding assistance applications, and log-term natural area management responsibilities.

State Agency Program Support. Promote a high level of State agency support for the Plan and program of project improvements including: a continuing role for the State Department of Parks and Recreation in the development of the Baylands Trail; the Department of Fish and Game in the development of an anadromous fish habitat program; the Department of Forestry in supplying native vegetation for restoration areas; in particular, a major role for the California Conservation Corps (CCC) in implementing recreation and restoration program improvements; and an essential role for Cal Trans in native woodland landscaping of highway intersections adjacent to the creek and development of pedestrian overpasses.

Navy Department and NASA-AMES Cooperation. Promote program cooperation and support for flood protection and recreational improvements in the Baylands including construction of a foot bridge and trail access for school children from the Navy housing area and for a secondary bicycle commute entry to NASA-AMES, and participation in construction of needed flood control improvements of Stevens Creek.

Pacific Gas and Electric Company Cooperation. Maintain agreements for public use of PG&E rights of way and coordinate access gate control and programs to upgrade transmission tower assignements into the recreational use and woodland restoration program.

Volunteer and Community Group Involvement. Encourage and facilitate opportunities for community groups to participate in vegetation planting, habitat restortion and maintenance efforts.

Planning and Project Development Procedures. Undertake the recommended planning and project development procedures by adopting the Long Term Plan and Program, and implementing the Five Year Phasing Program and Annual Program Review and Update.

Project Funding Assistance. Provide regular monitoring of State and Federal funding assistance programs applicable to Stevens Creek.

Regulatory Procedures. Provide a high degree of lead agency coordination in the administration of Development Review procedures, General Plan changes and the formulation of new Specific Plans within the creek corridor.

Creek Land Dedications to Water District. City to provide for dedication of creek land plus any adjoining land required for the Water District to provide flood and erosion control improvements where needed. Such dedications would be obtained from developing properties, as a condition of land development approval.

GOVERNMENTAL POLICY ROLES

• = Primary Responsibility x = Support Responsibilit

| RESPONSIBLE AGENCIES | | |

PLANNING ASSESSMENTS

PLANNING ASSESSMENTS

Introduction

This chapter presents technical assessments of flood and erosion problems, and the enviromental and urban conditions which form the basis of the recommendations of this report. The findings are the result of extensive field studies, review of available data and literature, and professional evaluations by participating scientists, planners, engineers, and landscape architects. Important contributions were also made by citizens of the community.

Assessment of geology, soils, vegetation, wildlife, stream geomorphology, cultural resources, land use and urban conditions, and recreational resources have a two fold purpose:

1. They provide an understanding of the problems, issues, and planning needs in formulating the recommended planning and management program;

2. They guide the design of compatible multi-use project improvements and enable the assessment of potential environmental impacts.

Since the Stevens Creek study corridor encompasses nearly eight miles and roughly 600 acres, a series of stream reaches were defined to organize the plan and management program into sub-area planning units. After careful analysis of channel and vegetative conditions, the presence of physical disruptions and roadway barriers, and changes in the urban setting, seven reaches were selected. Each reach is approximately a mile in length with Reach 7 the Bayshore reach, the longest.

Stream Geomorphology

Stevens Creek is one of three major streams in Santa Clara County. It drains a watershed of 38.35 square miles (at Bayshore Freeway). This includes 8.88 square miles of the Permanente Creek basin whose peak flows were diverted to Stevens Creek in 1959 and constitutes the major tributary to Stevens Creek on the valley floor. From its

headwaters at Russian Ridge in the Santa Cruz Mountains (elevation 2,500 feet), Stevens Creek flows southeasterly along the San Andreas Fault Zone, for 5 1/2 miles before swinging to the northeast and north to Stevens Creek Reservoir. From the Stevens Creek Dam and Reservoir in the foothills, the creekflows northward to San Francisco Bay, a distance of approximately 13 miles. The meandering course of the stream flows across the valley floor cutting a broad, flat-bottomed, steep-walled channel through alluvial fan deposits until it reaches the Baylands. This meandering configuration of creek channel and stream tells the story of the creek's natural history, or geomorphology, providing useful guidelines for management.

Streams are dynamic, ever-changing natural systems. Alluvial streams such as Stevens Creek represent a complex set of interactions involving channel geology, water flow and sediment concentrations, erosion and deposition. A balance exists between the shape and form of the channel and the amount of work the creek does in carrying water and water-born sediments to the bay.

Stream channel migration is caused by turbulent flow and irregularities in the creek channel. As water flows along the stream, the velocity increases toward the outside of curves and has the greatest erosive force at that point. The migration of the stream channel from side to side is reinforced as first one side and then the other is eroded.

During wetter portions of the Quarternary age, Stevens Creek had greater stream flows which carried more sediments out of the Santa Cruz Mountains and formed alluvial fans. In more recent time, as the region got drier, the growth of alluvial fans ceased and Stevens Creek began to incise its channel into the alluvial fan as a result of lesser flows and decreased sediments. Streams also tend to develop a concave stream gradient where the upstream gradient is steeper than the downstream reaches. An even stream gradient is developed by erosion of the high spots and deposition in the low spots. This is one of the reasons the lower part of Stevens Creek has had some siltation to compensate for the regional subsidence due to groundwater withdrawal. (Lowney Ass., 1978)

Prior to the urbanization of Santa Clara Valley, equilibrium stage had been reached where a certain amount of stream channel sediments migrating along the channel bottom caused only a gradual amount of undercutting and erosion and thus a medium amount of change in channel width and depth. This quasi-equilibrium stage has been slightly changed by urban growth due to the increased urban run-off to the stream channel and added flows of the Permanente Creek diversion to Stevens Creek. (Iwamura, SCVWD, 1973)

Today the portion of the creek from Homestead Road to Central Avenue shows the greatest potential for continuing change due to undercutting and continued migration of the stream channel. However, channel conditions vary from reach to reach. Reach 1, from Homestead Road northward, averages a channel depth of about 20 feet and varies in width from about 70 to 150 feet. The flat streambed is about 15 to 30 feet-wide, covered by loose sand, gravels, and occasionally boulders. In the next reaches, 2 and 3, the stream channel is about 40 feet deep and ranges from 80 to 200 feet-wide with one small area about 300 feet-wide at the top of the banks. In Reach 4, north of El Camino Real, the stream valley ranges from about 30 feet-deep to 20 feet past Central Avenue and the channel ranges from 80 feet to 180 feet-wide from bank top to bank top. Except for some deposition occuring in the Bayland portions of the creek, the morphological change of the stream in this area is minor due to the generally flat gradient of the stream and the confining flood control levees.

Judging from the active erosion occuring in reaches 1, 2, and 4, and the preponderence of recent bank slumps verses the apparent number of older slides, the rate of geomorphic change appears to be increasing. Thus a comprehensive management program is needed to temper and modify the rate of geomorphic change and mitigate potential damaging aspects.

Geology and Soils

The geologic units encountered in the study area consisted of alluvial deposits of Quaternary age, up to two million years old. The alluvium consists of loose to soft and friable gravel, sandy silt, and clay, in varying proportions. These materials are more or less size-sorted by running water into indistinct beds and lenses.

The source of the alluvium is the rugged Santa Cruz Mountains which border the Santa Clara Valley to the west and southwest. The Santa Cruz Mountains consist primarily of Franciscan Complex rocks ranging from sandstone and shale, greenstone, and sheared melange deposits characterized by hard, rounded masses of greenstone, chert, or sandstone surrounded by an unstable matrix of highly sheared shale.

From Homestead Road to Central Avenue the alluvium was deposited in large alluvial fans with moderate slopes toward the Bay. Individual sedimentary beds vary in thickness and lateral distribution, and consist of interbedded sandy gravels, gravelly sands and clays, and sandy and silty clays. In general the percentage of gravels decreases to the north. Alluvial fans are formed when fast moving, sediment laden mountain streams reach a relatively flat valley floor. The change of slope results in a rapid decrease in stream velocity which in turn causes the rapid deposition of poorly sorted sediments.

From Central Avenue to immediately north of Crittenden Lane, the alluvium consists of younger fluvial deposits, typified by interbedded fine grained sands, silts and clay. The sediments were deposited by slow moving streams at the outer edge of the alluvial fan.

From the area of Crittenden Lane to San Francisco Bay, the creek is underlain by young San Francisco Bay Mud, predominantly a silty clay, with local interspersed irregular lenses and layers of sand, peat, and shell frangments, The mud is blue gray to black in color, and contains abundant organic matter. It is soft and plastic throughout, although where exposed to the air behind levees, a firm crust several feet thick with large dessication cracks will develop.

The study area has generally well developed soils combined into three subgroups based on geographic locations, soil drainage, and original sediments. The largest area from Homestead Road to Central Avenue is dominated by moderately well to somewhat excessively drained, medium to fine textured soils of the alluvial plains and fans. These soils have been used in the past for irrigated row crops, orchards, dryland hay and pasture, and include the most productive soils in the Santa Clara Valley. Erosion is not usually a problem except along drainage channels.

The area from Central Avenue to Crittenden Lane is dominated by very deep, level, somewhat poor to poorly drained soils. The fine texture and slow permeability creates severe limitations for septic tank filter fields. Shrink-swell behavior is moderate to high.

The area from Crittenden Lane to San Francisco Bay is dominated by fine textured soils influenced by tidal water. These soils are affected by high concentrations of salts. The soils are flooded at high tide when not protected by levees. (Lowney Assoc., 1978)

Groundwater

Generally the water table is moderately deep in the southern part of the study area, and gradually nears the surface to the north. The depths to groundwater between Homestead Road and Central Avenue can range from as shallow as 24 feet to as deep as 80 feet in the alluvial fan deposits. From Central Avenue to Crittenden Lane, depth to groundwater varies from four feet to 17 feet inthe fluvial deposits. Adjacent to the Bay, groundwater is very near the surface and ranges from one foot to five feet in depth. Part of the variability within each subarea may be related to seasonal changes (Rodgers and Williams, 1974).

Up until approximately 1968, much of the land in the study area underwent subsidence due to groundwater withdrawal (Poland, 1971 and 1976). The artesian head declined 180 to 250 feet and the land surface subsidence amounted to approximately 6.5

feet near the Bayshore Freeway, with decreasing amounts to the north and south. The subsidence was caused by the decline of the artesian head and the resulting increase in effective overburden load on the water-bearing beds in the confined system. The sediments compressed under the increasing stress and the land surface sank. Most of the compression occured in the fine grained clayey beds (aquitards) as their pore water pressures decreased.

Since 1967, the artesian head was recovered about 100 feet due to an increase of surface water imports, favorable local water supply, decreased groundwater withdrawl, and increased recharge. The subsidence has stopped throughout the system. However, subsidence would likely recur if the artesian head is drawn down appreciably below the levels of 1971-1973. The drought of the last two years (1976-77) did not reportedly cause any additional subsidence.

The regional subsidence resulted in alteration of the Stevens Creek stream gradient causing filling of the depressed stream channel with sediment. The flood control levees between Bayshore Freeway and San Francisco Bay were originally needed to protect subsiding areas from flooding. Since the subsidence is regional, it has not caused differential settlement foundation problems for individual structures in the study area. (Lowney Assoc., 1978)

Groundwater Percolation Program

Stevens Creek is managed as a groundwater recharge facility to control regional land subsidence due to diminished groundwater. During the summer months, water is released into the stream from Stevens Creek Reservoir and the District's imported water turnout at Stevens Creek Boulevard. The second source of water is imported from outside the county and is used to supplement reservoir releases.

During the summer, the flow rate from these upstream releases is regulated to permit water percolation into the streambed no further downstream than Remington Drive in Sunnyvale. The depths of flow associated with these flows is from four inches to

12 inches. The minimum flow varies widely from year to year due to the amount of rainfall runoff impounded at Stevens Creek Reservoir. For example, the average daily flow of the creek measured at Stevens Creek Boulevard ranged from a high in February during the west 1972-73 season fo 98.12 cubic feet per second (Cfs) compared to a low of .42 Cfs in the 1976-77 drought season for released flows only. Summer stream flows in the 1972-73 wet season range from almost 20 Cfs in April to nearly 13 Cfs in September, whereas in the last drought season a high of 1.38 Cfs was recorded in June to a low of .12-Cfs in August of 1977. (SCVWD, 1978)

Faults and Seismicity

Santa Clara Valley is bounded on the east and west by three active fault zones, the Hayward, Calavaras and San Andreas. In addition, there are less well understood faults projected under the alluvial valley floor. The San Andreas Fault Zone is located five miles southwest of the intersectionof Stevens Creek and Homestead Road. The Hayward and Calaveras Faults are located in the East bay, eight and 13 miles, respectively, northeast of the mouth of Stevens Creek at the Bay.

The Sargent-Berrocal Thrust Fault, with several mapped strands, is located in the foothills of the Santa Cruz Mountains. The closest strand is located 1.5 miles southwest of the study area at Homestead Road. This fault shows some evidence of Quaternary movement (McLaughlin, 1974), and should be considered potentially active.

Recent investigations of gravel aquifers in the subsurface of Santa Clara Valley by the Division of Water Resources indicate a number of concealed faults (Ford, 1975). Based on water well data, two normal faults intersect Stevens Creek: The Santa Clara Fault crosses Stevens Creek in Reach 3, and the Cascade Fault crosses the creek about half-way between Fremont Avenue and Homestead Road in Reach 1. The potential for activity of these faults is unknown.

Santa Clara Valley is in a seismically active area and has been affected by a large number of earthquakes, most of which were associated with the San Andreas, Hayward

and Calaveras Faults. The maximum credible earthquake which could affect the study area would be 8.3 Richter Magnitude on the San Andreas Fault (Greensfelder, 1974). The study area would likely be subjected to strong groundshaking in the event of a moderate to sever earthquake. Other potential seismic hazards include liquefaction, seismically induced landslides, and inundation. (Lowney Assoc., 1978)

Ground Shaking

In 1906, the study area was subjected to very stong shaking as described by the Report of the California Earthquake Commission. In Mountain View, large numbers of chimneys collapsed as did about half of the water tanks. Bridges across Stevens Creekwere not damaged. At least one large landslide occurred on Stevens Creek upstream of the study area. The study area was subjected to earthquake intensities of VII to VIII on the Modified Mercalli Intensity Scale which is based on observed earthquake damage.

Intensity of groundshaking is controlled by a number of factors including magnitude of earthquake, distance from earthquake epicenter and fault, and rock and soil types and distribution. Borcherdt,Gibbs, and Lajoie (1975) have compared intensities for the 1006 earthquake with difference geologic units and developed a map of predicted maximum earthquake intensity in the San Francisco Bay Region. According to their work, the study area would be subjected to groundshaking intensities from strong to very strong depending on the geologic units. In general, the older, denser alluvial fan deposits from Homestead Road to Central Avenue would be subjected to strong groundshaking and the younger, less dense alluvial deposits and soft Bay Mud would be subjected to very strong groundshaking. (Lowney Assoc., 1978)

Liquefaction

This is a secondary effect of an earthquake which can turn a firm ground surface into a water fluid incapable of supporting structures. Liquefaction is defined as the transformation of a granular material from a solid state to a liquefied state as a

consequence of increased pore-water pressure developed during shaking. Seismic groundshaking tends to compact granular sediments, which causes a transfer of load from intergranular contacts to the interstitial pore water, thereby increasing the pore-water pressure. Liquefaction is most likely to occur in beds of loose, water-saturated, well-sorted silt and sand within 100 feet of the ground surface (Lajoie and Helley, 1975).

In a very general, qualitative way, geologic and engineering data indicate that liquefiable deposits exist to varying degree in all of the alluvial units. The liquefaction potential of Bay Mud and underlying sediments, from near Crittenden Lane to San Francisco Bay, is generally low to moderate, but may be locally high where saturated clean granular layers are present in Bay Mud. Loose well-sorted sand and silt beds occur in the Quaternary alluvium but are not permanently saturated because of the fluctuating groundwater levels. From Crittenden Lane to Central Avenue, depth to groundwater varies from four feet to 17 feet in the finer grained alluvial deposits resulting in moderate potential for liquefaction. From Central Avenue to Homestead Road, depth to groundwater varies from 24 feet to 80 feet in the alluvial fan deposits resulting in low to moderate potential for liquefaction (Lowney Assoc., 1978).

Lateral Spreading and Seismically Induced Landslides

Other types of ground failure are related to liquefaction. Lateral spreading failures occur on gentle to nearly horizontal slopes underlain by saturated, loose granular layers, and would flow towards a free surface such as an open channel. Flow landslides are failures that generally occur on moderate to steep slopes underlain by saturated, loose granular deposits. Once liquefaction has occurred, flow deformation commences and continues until the driving shear forces are reduced by slope reduction to a value less than the viscous shear resistance of the liquefied soil. When this happens, the soil stops flowing and solidifies. The potential for these types of failure in the study area are similar to that for liquefaction.

Earthquake Related Flooding

There are two types of seismically induced flooding which could affect portions of the study area. Flooding caused by the run up of tsunami waves would only affect the outer part of Reach 7. Earthquake caused failure of Stevens Creek Dam would result in the inundation of an area along Stevens Creek between Homestead Road and Remington and spread out to the east of Stevens Creek into Sunnyvale.

Erosion Control Program

The process of creek channel erosion, which carves and changes the shape of the creek channel is a continuing geomorphic process requiring a practical management approach. Although many measures can be undertaken to reduce the rate of erosion and mitigate some of the worst damage, it is also essential that this on going natural process be recognized in the planand management program.

In general, the high velocities of stream flow and stream sediment load are the cause of the active erosion and bank undercutting occurring in Reaches 1 and 4. The abrasive nature of the stream flow will erode even hard surfaces such as the concrete under the SPRR Bridge which has been so worn as to resemble a cobblestone street. Although bank erosion tends to be greatest at the outside curves of the meandering stream, a number of other factors affect channel erosion:

1. Under high flood flow conditions, such as the projected one percent flood, erosion rates would be correspondingly increased. Stream velocities are projected to be as high as 18 feet per second in some locations. Undercutting and sloughing of overhanging banks would occur at a scale far greater than is experienced on a year-to-year basis.

2. Erosion occurring in the watershed from large scale grading or removal of vegetative cover will contribute more sediment to the stream and increase the instream erosion process.

3. Vegetation cover protects the sidewalls from erosion where the type and coverage are sufficient.

4. The different soil types along Stevens Creek have varying degrees of strength and resistance in holding up the valley walls. Where weaker than destabilizing factors, landsliding of the creekbank takes place.

The worst conditions of erosion occur in Reach 2, especially in the west bank just downstream of the eroded drop structure and adjacent to the freeway. Severe soil erosion is also taking place on the east bank opposite Diericx Drive in Reach 3, on the west bank north of El Camino Real,and the east bank just north of Dana Avenue in Reach 4.

The Slope Stability Problem

The everchanging character of the creek channel requires delineation of stable and potentially unstable areas as a means of providing planning and management guidance.

Landslides are among the more dangerous forms of channel erosion. They are caused by a number of factors: The most common occur where water percolates into weaker soil materials, adding weight beyond the coehesive strength of the soil, creating slippages. In some cases, the heavy vegetative cover, particularly trees with deep penetrating roots, tends to hold these surficial deposits together and increases their stability. Although most percolation occurs naturally, where septic tanks adjoining the creek seep effluent flows into the bank, they create less stable channel walls. Creekside irrigation can have the same effect.

One of the obvious causes of landsliding is where steep bluffs are undercut by the stream course. Other forms of direct urban run-off into the creek channel create gullies, especially at outfall points. Earthquakes can have a dramatic effect on the amount of landsliding within the creek channel. Strong ground shaking can trigger failures at the time of an earthquake or it can jar and loosen bank materials leading to failure at some later time.

Accordingly, maps of the corridor were developed by John V. Lowney and Associates, Soil and Geologic Engineers, to delineate the unstable zones bordering the creek. The mapping methodology included utilization of topographical maps which provided information on the configuration, heights and steepness of slopes, geologic and soil maps indicating the distribution of earth materials, and reconnaissance field studies to determine existing landslides and areas of active erosion.

Particular attention was given to easily erodable sand layers which could result in undercutting of the stream banks. A limited amount of sub-surface soils information available from test borings from bridge sites along the Stevens Creek Freeway and scattered foundation investigations near the creek provided a general idea of soil types, densities, and depth to ground water. Seismic factors such as liquefaction and lateral spreading was also evaluated.

The map of Relative Slope Stability indicates the limit of unstable slope areas, the presence of older and more recent slides or slump activity, and sets forth four categories of slope stability from least stable to most stable slopes and also identifies manmade structures.

The map is intended to convey information about slope stability in a form that will serve as a basis for making planning and management decisions about relative slope stability, land uses, and identification of areas where management measures are needed. The map is no more precise and complete than its source materials and is dependent on selecting and judging relative values. Since the zonation map is based on limited surface materials data, it should not be used to make detailed engineering evaluations of relative slope stability of individual sites. The categories of relative slope stability are defined as follows:

Category I

Includes the least stable slopes varying from about 1:1 to vertical and with bare ground to moderate ground cover. Includes areas with abundant evidence of recent slides

and active erosion and generally is located on the outside of stream curves susceptible to undercutting. Category I zones with very deep slopes would also be susceptible to landsliding triggered by ground shaking, particularly when the soils are saturated during the rainy season.

Category II

Includes moderately stable slopes ranging from 2:1 to 1:1 with moderate to heavy ground cover and some evidence of older slide activity.

Category III

Includes the most stable areas with slopes of about 2:1 and not evidence of slope stability.

Category IV

Includes relatively stable areas with manmade structures such as rock riprap and concrete sack riprap and concrete drop structures for erosion and flood control.

Solving Erosion Problems

In order to improve creek channel stability and reduce the threat of hazard to the safety of life, property, and the environmental damage caused by undercutting of the riparian vegetation, a balanced program of structural and non-structural erosion control and hazard protection is recommended which is compatible with environmental and recreation resources. Because the severity of erosion problems and the degree of hazard vary, a range of erosion and hazard mitigation measures should be undertaken including land use controls of new development in unstable areas, continuation of the home purchase program in Reach 3 where structural engineering solutions are infeasible due to high cost, remedial structural armoring measures where appropriate, and vegetative measures of erosion control.

Geologic Hazard Setback Line

This designation is intended to serve as a basis for making planning and management decisions in the creek regarding the hazard of slope stability, the location

of existing and future structures and land uses, and indentifying areas where management measures ae needed. The Geologic Hazard Setback Line estimates those areas which are subject to potential ground failure and slope instability due to erosional processes or ground shaking during a earthquake.

A series of setback distances have been determined for each slope stability category: Category I slopes were assisgned a 2.5:1 setback; Category II slopes were given a 2:1 setback. The delineation of the Geologic Hazard Setback Line (see appendix) varies throughout the corridor according to channel conditions, particularly the depth of the channel. The setback is measured from the base of the slope such that the deeper the channel, the greater the horizontal setback. The Geologic Hazard Setback Line should provide the basis for local development policy indicating where potential hazards are present and the steps needed to mitigate the instability where new development within the line is proposed.

Erosion Mitigation Measures

Based on the analysis of erosion and slope instability problems and an erosion-design criteria of eight feet per second as a maximum permissible streamflow velocity without lining or armoring, structural erosion protection is to be provided under the following circumstances:

1. Areas identified as undergoing severe erosion creating hazardous conditions will be corrected during the first stage of construction of the project. The four priority areas indicated in the preceding section fall under this category.

2. Other areas identified as undergoing active or developing erosion problems will be corrected as needed on a case by case basis during the normal maintenance program of the District.

Three kinds of structural erosion protection works have been recommended:

1) Sacked concrete lining; 2) Rock lining; and 3) Gabion lining. Except in extremely steep slopes, all except the last are capable of incorporating landscape

enhancement, pedestrian access or improvement of the aquatic environment and appearance as a means for achieving multiple benefits. Sacked concrete lining is recommended only in those places where slopes are too steep to accommodate rock lining or gabion lining. Past experience with this type indicates that it has sometimes undermined and failed. Both sacked concrete and gabion lining should be extended to two feet above the one percent flood level, however, the rock lining may or may not be placed above the one percent flood level.

Specific areas requiring erosion protection are described in the Chapter 5 descriptions of the Physical Plan. Where minor erosion control works are concerned, no alternatives are considered. However, for major erosion control works, a few alternatives were evaluated:

The drop structure in Reach 2, known as Smith Dam, was built many years ago for the purpose of irrigating farms in the upstream areas. It is in extremely poor condition and badly undermined. In 1977 the District installed large sized rocks below the structure to prevent further undermining and collapse. Since the structure is 12 feet in height,it is a major obstruction to upstream migration of anadromous fish. Two correctional alternatives were considered. One, would be to replace the existing drop structure with a cement concrete energy dissipator; estimated to cost $355,000 with a fish ladder incorporated into the design. However, a much less costly, more natural-looking solution was selected involving retaining the existing structure, using grouted rock lining below, and providing a fish ladder. This solution is estimated to cost approximately $220,000.

In the west bank north of El Camino Real, two alternatives were investigated to control bank instability and erosion. A trapezoidal concrete channel and a trapezoidal gabion-lined slope were compared from a cost standpoint. With a gabion-lined solution, the estimated cost of $268,000 was favored over the costlier $305,000 concrete channel. The gabion structure would also be more appropriate to the natural setting and

would also accommodate a needed access ramp for maintenance vehicles to the creek botton 35 feet below.

Sedimentation Mitigation

Closely related to the upstream erosional problems are the sedimentation conditions occurring in the bayland portions of the channel due to the low velocities of stream flow in that area. Over time, sediment deposition may reduce channel capacity. Although the one solution would be to constrict the channel to increase flow velocities and thus flush sediments out to the bay, this would cause a rise in upstream water levels and still result in some build-up of silt. A more practical solution is to remove built up sediments on a "as required basis" as part of normal maintenance activities of the District.

Flood Control Program

Planning for flood protection is based on the determination of the flow of water from a drainage area that has a one percent chance of occurrence in any given year. The so called "one percent flood" is the preferred description of the flooding which is the policy basis for flood control provided by the Santa Clara Valley Water District. This design flood is also termed the 100-year flood, but is should not be thought of as an event that occurs regularly every 100th year. As a statistical value the one percent flood has a small risk of occurrence in a given year, but risk is cumulative. It is possible that two repetitions of this flood flow could occur in a single year or that a single event may not occur even once in 200 years.

The magnitude of the one percent flood is calculated by using statistical hydrologic methods. Since it is the desire of the District to provide equal protection from flooding to all residents, a uniform method of determining design flood flows is required; on that is regional in scope and minimizes the chance of providing unequal protection from one area to another. Importantly, the methodology used by the Santa Clara Valley Water District in its determination has been developed after considerable

effort and has been reviewed and approved by the academic and professional community. The regional peak flood frequency analysis is utilitzed which is based on the best available hydrologic data form stream systems within and adjacent to the District.

The Flooding Problem

Desipite the minimum flood protection provided by Stevens Creek Reservoir since its construction in 1935, flooding has occured in areas north of Bayshore Freeway and south of Highway 280. During the 1955 flood about 1,000 acres was flooded north of Bayshore. No doubt this flooding would have been more extensive if it were not for the limited protection provided by the reservoir.

Although high flows recorded at the Central Expressway stream station range from 1,000 cubic feet per second of maximum flow in January 1964 to a high of 2,600 cfs in 1968, the estimated one percent design flows are higher. As indicated in the accompanying table, flow rates of the one percent design flow range from 6,000 cfs at Homestead Road to 7,340 cfs at the Bayshore Freeway.

STEVENS CREEK - ONE PERCENT DESIGN FLOWS

LOCATION	FLOW RATE (cfs)
Homestead Road	5,700
Just upstream of confluence with Permanente Diversion	6,140
Just downstream of confluence with Permanente Diversion	7,320
At El Camino Real	7,230
At Bayshore Freeway	7,340

RECORDED HIGH FLOWS AT STREAMGAGE

STATION 35 AT CENTRAL EXPRESSAY

DATE	MAXIMUM FLOW (cfs)
April 1, 1958	2,600
January 26, 1969	2,500
January 31, 1963	2,000
January 5, 1963	1,300
December 23, 1955	1,150
March 16, 1967	1,100
January 3,1974	1,004
January 20, 1964	1,000

Streamflow records (1938-39 to present) from

Stream Gage Station 35 at Central Expressway

Fortunately, due to the large channel capacity, stream flows from the one percent flood would be confined within the banks from Homestead Road to Dana Avenue. However, flooding is projected for areas downstream of this point.

Between Dana Avenue and the Southern Pacific Railroad bridge just south of Central Expressway, the relatively shallow depth of the creek and the flow restrictions caused by the West Evelyn Avenue and SPRR bridges limit the flow capacity of the creek channel to 5,000 cubic feet per second at this point. This capacity is inadequate to contain the projected one percent flow of 7,340 cubic feet per second. A flood breakout on the west side of the creek is predicted whereby flood waters would follow the tracks west to Castro Street and across Central Expressway, spreading along Sterling Road, Moffett Boulevard and Middlefield Road as far west as Rengstorff Avenue and Highway 101. In all, 300 acres of urban land would be flooded, including 170 acres of industrial and commercial and, 80 acres of which would be subjected to more than a one foot flood. Although most flooding would be less than a foot, in certain low lying areas near Highway 101 flooding would exceed three feet. About 340 homes and 30 apartment complexes would also be affected by the flooding.

Overbanking would also occur as a result of the one percent flood on the east and west sides of the creek, downstream of Bayshore Highway. Moffett Field Naval Air Station and NASA Research Center would be affected on the east and a mobile home park and many commercial structures on the west. Flooding of the air station land would occur just north of the Moffett Field Apartments. The existing flow capacity of only 2,000 cfs would be exceeded by the anticipated one percent flood flow of 7,340 cfs, producing widespread, shallow flooding. In the Shoreline Park area, from Crittenden Lane northward, the western levee is one to two feet lower than the eastern levee. Overbanking would spill into the salt ponds and marshland refuge area of Shoreline Park.

Solving Flooding Problems

A feasible program of flood protection in keeping with the environmental and recreational attributes of the creek open space is recommended. The criteria used in the design of flood control measures comply with District policy and follow accepted engineering standards. The objective is to prevent flooding up to the one percent flow capacities. The use of the one percent flood as a design and evaluation standard is based on previous experience which shows this flow is most economically feasible to control. The Flood Insurance Administration also has adopted the one percent flood as a standard for flood insurance and flood plain regulation.

For the purposes of design, the minimum freeboard or vertical distance between the design water surface and the top of the channel, is a minimum of two feet in the channel. However, to avoid costly replacement of existing bridges, less than two feet of freeboard, or even pressure flow if structurally capable, may be permitted at bridges.

In selecting the proposed control measures, considerable effort has been made to preserve existing trees wherever possible and to encourage reestablishment of riparian habitat when construction of new structures or modification of existing structures is required. Also, selection of flood and erosion control measures has been done so as to enhance, rather than preclude, the reestablishment of a steelhead fishery in Stevens Creek.

In developing recommended flood protection measures, alternative solutions were considered at two levels: on regarded broad alternatives dealing with overall flood protection approaches to the entire stream; the second set of alternatives deal only with detailed alternative engineering solutions to specific flooding problem areas.

As stated previously,it is the established policy of the District to provide protection against the one percent flood. Without that protection there is potential for loss of property and life, with property damage running into the millions. Although property owners may purchase flood insurance under the National Flood Insurance

Program, they are subjected to a hazard to life and property as well as the cost of insurance and the inconvenience of clean-up necessary after flooding.

One alternative to reduce the threat of damage and hazard of flooding would be to develop an emergency flood fighting system. If advanced flood warnings were possible, a more effective program of flood fighting and evacuation would be achievable. Such a system could reduce potential hazard and damage, yet with an increased amount of disruption and inconvenience without eliminating the possibility of property damage. At present the District is investigating the feasibility of developing a flood warning system in areas south of Highway 280 which would require continued purchase of flood insurance by individual property owners. The annual operational cost of such a system for Stevens Creek would be approximately $50,000.

Consideration of Stevens Creek Reservoir as a flood control facility was also made. By giving up the reservoir function as a water conservation facility for instream recharge of depleted ground water basins, the 3,600 acre-feet of total storage capacity of the reservoir could be made available for flood storage. Although the amount of flood protection available from the existing reservoir would depend upon the water which accumulates in the reservoir from rains preceeding a one percent flood, this option would reduce but not prevent overbanking. Giving up the groundwater recharge program would be acceptable, however, because subsidence could resume, and the cost of water from an alternative source would be prohibitively expensive.

Spillway modifications which would improve the flood reduction capability of the reservoir were also considered. One technique would be to lower the crest of the existing spillway by three feet and install a gate; however, the risk associated with this approach is the reliance placed on timely operation of the gate mechanism. A second method would be to raise the dam by ten feet and modify the spillway to improve flood protection. Neither one of these approaches however, produces a significant reduction in flood releases (less than 500 cfs) to prove worthwhile. Furthermore, cost of raising the

dam was estimated at 2.5 million dollars and the cost of reservoir modifications from 1.5 to 2 million dollars. Thus, the total cost would range from 4 to 4.5 million dollars which far exceeds the cost of downstream improvements. This alternative would not prevent downstream flooding but would reduce the amount of area flooded and the height of flooding.

Although it will be necessary in the future to consider structural upgrading of the Stevens Creek Dam to reduce the risk of dam failure in the event of an earthquake, it may well be unlikely that a significant, added flood protection capacity could be attained, even though cost would be more justifiable due to the primary need to fulfill seismic safety requirements. However, provision of a flood protection benefit should be considered at the time dam and reservoir designs are developed for seismic safety purposes.

The above review of broad flood control approaches applying to the entire streamway points to the need for specific project improvements in each of the flood problem areas within the study area. For each of these, specific engineering solutions were considered.

Two alternatives were considered as solutions to flood problems in the portion of Reach 4 just south of the West Evelyn Bridge. Since the flooding in this reach is caused by the backwater effect of the flow restrictions imposed by the crossing bridges and the drop structure in that area, the first alternative considered was to correct these structural problems. This solution would include rebuilding the three bridges to enable adequate flows, moving the drop structure upstream of the bridges to the Dana Avenue vicinity and excavating and widening the channel with sacked concrete lining from the railroad bridge to Dana Avenue. The estimted cost of this alternative is $1,315,000.

Due to the high cost and environmental damage associated with this alternative, this was abandoned in favor of a second alternative which is to install two 450-foot-long, ten-foot-diameter bypass pipes to route flood flows past the three bridges and to raise

the landscape about 800 feet of the west bank upstream of West Evelyn Avenue to provide additional freeboard above the west creek bank. This alternative, estimated to cost $721,000 would not disturb the existing bridges and would retain the existing riparian woodland (except for the removal of two or three Eucalyptus trees near the outfall of the proposed conduits).

Having contained the potential overbanking at Central Expressway in Reach 4, improvements would be necessitated in Reach 5 to contain flood waters. Flooding potential in this area is caused by the inadequate box culvert under Moffett Boulevard and the backwater effect caused by the 6.5-foot-high drop structure near Bayshore Freeway.

Three solutions were considered: One was to raise the existing levees in the area an additional seven feet, requiring in turn raising of several high-tension transmission towers. This alternative would cost $260,000. The second alternative, costing $500,000, would consist of demolishing the existing drop structure and constructing a new on at Moffett Boulevard (which would incorporate a fish ladder into its design) and concrete lining of the creek from Moffett Boulevard to the old drop structure, and minimum raising of levees north and south of Moffett Boulevard a height of one to two feet.

A third, preferred, alternative would be less expensive than the first two and have far less environmental impact (especially, impact associated with the concrete-lined channel). This alternative includes: a 12-foot-diameter diversion pipe to carry flood flow around the existing drop structure, the addition of a fish ladder to the drop structure; leaving the remainder of the channel in its existing condition; and raising part of the east bank levees an average height of two feet. Total cost would be $219,000.

Several detailed levee designs were also considered in the area adjacent to the Moffett Field Naval Air Station where present levees are inadequate. These included lining the channel to increase flood flows, a low flow channel with depressed maintenance road and raised levees, and a channel with flood wall and raised levees. Of

these, the last alternative is preferred because it is lower in cost and will have minimal environmental impact. Total cost of the third alternative was estimated to be $714,000.

In Reach 7 it is proposed that the west bank levee be tied in with the proposed Shoreline Park levee in that area rather than to improve the existing levee immediately adjacent to the creek. Two alternative designs were considered, however, in extending the levee from Crittenden Road to Shoreline Park. The preferred design, a raised levee which is two feet above the one percent flood level, provides for a 15-foot-wide right of way at the top of the levee which allows for maintenance road and trail use and provides a three to one side slope.

No flood protection recommendations are to be made for the creek north of Shoreline Park flanked by salt ponds and marshlands at this time. The final selection of the project in this area will await studies by the Corps of Engineers on the need for Bayfront levees. However, two options should be considered in the future and were briefly examined during this study. One is to raise the existing levees only, at a cost of $1,088,000. The second concept is intended to provide expanded marshland environment and recreational benefits withina meandering channel design. This option is expected to cost slightly more, or $1,165,000 (see Reach 7 discussions).

Each of the recommended flood protection improvements is discussed in Chapter 4. Total estimated erosion and flood control project costs are given in the accompanying table.

Biotic Resources Program

Creek corridors contain highly valuable biotic resources. Under wildland conditions, the water, forage, and vegetation density of riparian habitats are the backbone of wildlife habitats. In urban and developing areas, natural creekways offer vital refuge to many wildlife species. In addition, these streamways offer the last visible vestige of natural elements and life forms to many urban residents.

Urban encroachments and disturbances serve to constrain the natural ecological functions of a creek corridor. Many of the "trophic" levels of the food chain, the life forms that produce food and the life forms that consume, are damaged or destroyed. The system of checks and balances is incomplete; as a consequence, the ability of the biotic system to mature and stabilize is impaired. A high level of management is needed to maintain the biotic productivity, diversity, and stability of urban natural areas.

Vegetation and Wildlife Values

There is a gradual but dramatic transition in habitats along Stevens Creek from the upstream riparian woodlands near Homestead Road to the rich cordgrass, salt marsh, and mud flats at the edge of the open waters of San Francisco Bay. A great diversity of wildlife accompanies the change in vegetative plant communities and ranges from the raccoons, squirrels, jays, chickadees, and woodland birds inhabiting Reaches 1 and 2 to the sandpipers, avocets, egrets, pelicans, and occasional harbor seals present toward the mouth of the creek. Although wildlife is normally abundant along the creek corridor, during drought periods and when the creek is dry, a reduction in populations is noticeable.

Wildlife within the upstream portions, particularly the woodlands, is typical of riparian habitats. Missing are the larger birds of prey and larger mammals which have been unable to adapt to urban conditions and domestic animals. Despite these limitations, the contrast of the natural corridor within the urban setting increases the sense of value. Although urban development at the edge of the creek corridor often interferes with natural wildlife patterns, in some instances, man's devices serve to improve or increase the habitat potential. Transmission tower lines within the corridor increase perching possibilities for birdlife. Within the baylands, the salt ponds enhance wildlife diversity by introducing additional rich food sources and resting areas.

The creekway has suffered widespread deterioration in several areas. Motorcycle use abuses the understory vegetation and disrupts the soil mantle, affecting plant stability and discouraging woodland regeneration. Herbicides applied to adjacent lands

wash into the creek and destroy plant life. Channel erosion continues to undermine the stately, older trees and inhibits replacements. Where the channel follows natural meanders, maximizing varied conditions of sun, shade, and wind, plant and animal life is enriched. Where channelization has taken place and the creekbed straightened, mature vegetation has been removed; new woody vegetation is rapidly restoring the vegetative quality and provides significant biomass of grasses, shrubs, and weedy plants to support the local wildlife.

The conservation and restoration of these wildlife habitat values is a fundamental objective of the Stevens Creek plan. The assessment of biotic conditions within the creek has led to the development of specific management fundamental objective of the Stevens Creek plan. The assessment of biotic conditions within the creek has led to the development of specific management guidelines. The guidelines provide a basis for measuring and mitigating potential adverse environmental impacts of proposed programs and structural improvements and guide the development of enviromentally sound flood and erosion control improvements. With proper management, vegetative conditions and wildlife habitats can be improved. These natural areas may then serve as the focus for educational programs and community activities.

Vegetative Conditions

The dominant trees in many reaches of the creek are its most apparent asset. Several distinct natural plant communities are found within the corridor; most are remnants of the landscape of the past. These plant communities include salt water marsh, fresh water marsh, grassland, oak woodland, and riparian woodlands. Field studies reveal several distinct sub-units of the riparian biotic community: a sycamore-dominated riparian woodland unit, an oak-dominated unit, a cottonwood unit, and a willow unit. Each includes a mix of other trees and understory plant types.

Because of the great amount of modification in the baylands, marsh development is reduced from the vast marshland of the past. The oak woodlands which once

characterized the Santa Clara Valley are now so altered as to be barely recognizable; remnant trees flank the upper creek terraces. The remaining grasslands are the result of secondary succession following obliteration of the original communities during the construction of highways and dwellings.

The riparian woodlands, on the other hand, in the remaining natural and unchannelized portions of the creek, form significant stands of mature sycamore, oaks, and cottonwoods, and includes specimen trees of great girth and height. Where a healthy understory occurs, woodland type is enhanced. However, the widespread disturbance to the woodland warrants careful management to ensure its conservation.

The following is a brief description of each of the vegetative community types:

Saltwater Marsh

Marshlands within the study area are confined to the immediate margin of the creek sloughs at the bay mouth. Dominant species are cordgrass (*Spartina foliosa*), pickleweed (*Salicornia* spp.), and saltgrass (*Distichlis spicata*). The tidal slough "eyebrows" which fringe the channel provide the only truly balanced ecosystem in the entire Baylands without which the mud flats, salt ponds, and uplands would become sterile. They constitute the highest ecological value of any site in the Baylands, providing year round habitat and forage resources for a resident wildlife population and winter grounds for large numbers of migratory wild fowl. The slough "eyebrows" may be damaged considerably by excessive natural conditions such as winter runoff and by engineering activities including dredging and levee construction.

Fresh Water Marsh

Patches of fresh water marsh occur within the stream channel upstream beyond tidal influence. Cattails (*Typha* spp.), nutweed and cypress are the dominant species. Rapid winter stream flows and annual maintenance of the channel, including periodic clearing to avoid sedimentation problems, limit the development of this vegetative community. Nonetheless, the fresh water marsh offers refuge to numerous birds and amphibians and certain mammals.

Grassland

The creekbanks and open sunny terraces of the stream support a weak and typically disturbed community of grasses. Some of these grasslands support an occasional coast live oak or valley oak and evoke the savannah character of the former extensive open oak woodlands which dominated the Santa Clara Valley. The dominant grassland species are the annual grasses (Avena), wild oats, rip-gut and foxtail. Brush species are currently taking over much of the grassland area, further eroding the last remnants of the historic community.

Oak Woodland

The valley oak (Quercus lobata) and the coast live oak (Queecus agrifolia) found occasionally on the open upper terraces of the streambed and in the grasslands, now increase their numbers on the higher banks and along the margins of the foothills. Here, because of the deeper soils and an ample supply of ground water, they have attained old age and great size. These woodlands are a small remnant of the vast oak stands which once prevailed throughout the Santa Clara Valley. California Buckeye (Aesculus californica) and California Bay (Umbellularia california) may accompany the oaks.

Riparian Woodland

This biotic community extends throughout the upstream reaches of the study area. Dominant species include sycamore, cottonwood, willow and coast live oak. In many places, the native plant community has beenn invaded by non-native species including eucalyptus and ornamental trees; pampas grass, bamboo, oleander and broom are able to compete with the native species, and the giant reed (Arundo donax) often constitutes a pest as it proliferates within the streambed and impedes waterflow. The riparian vegetative community may be further divided into the following sub-units:

Sycamore unit. California sycamore (Platanus racemosa) form a narrow band along the immediate margin of the meandering stream course in the upper reaches of the creek, particularly Reach 1. Their exposed roots serve

to anchor the stream bank as it slopes, at first gently and then abruptly up, inviting a second vegetative zone comprised of buckeye, oak and cottonwood.

Mixed Unit. The mixed riparian vegetative community occurs along the steep upper bluffs typical of Reaches 2 and 3. As the banks of the stream narrow and steepen to a depth of 35 to 40 feet, the sycamores and their gentle slopes are left behind and cottonwood, oak and willow appear. Smaller numbers of walnut and locust are found and although the understory is highly disturbed, toyon and blackberry abound.

Cottonwood Unit. A mature growth of native Fremont cottonwood (*Populus fremontii*) dominates the lush riparian community along the steep banks of Reach 4. Although bank undercutting threatens some larger trees,,young cottonwoods are moving in to replace the canopy. Subordinate species include black walnut, bigleaf maple, alder, some oaks, willow and sycamores.

Willow Unit. The steep ravine conditions of the upper reaches give way in Reaches 5 and 6 to a straight levee-flanked channel with a relatively flat profile. Many species of willow (*Salix* spp.) grow along the shallow banks of the streambend and dominate the vegetative community. Although some mature cottonwoods are present, the vigorous willow growth and dense understory of blackberry and poison oak prevent establishment of other species.

Wildlife Conditions

Wildlife habitats within the creek corridor are diverse and of varying productivity. The significance of the wildlife found within the upstream reaches lies in its perceived value to urban residents; however, the wildlife of the baylands protion of the creek is the more spectacular. Several rare and endangered species find refuge in the habitat remnants of San Francisco Bay. Thousands of migrating and wintering shorebirds feed on the mudflats and channel marshlands at the mouth of the creek.

There is increasing evidence that without the remaining rich mudflats of the bay, many species of western shorebirds which breed in the subarctic and arctic might be threatened with extinction. The bay is a critical link in the fragile chain of Pacific Coastal wetlands essential to migrating shorebirds. Their survival depends on preserving the remaining marshes and mudflats and restoring marsh and mudflat habitat where possible.

Wildlife populations along the creek corridor are regulated by vegetative conditions and by the availability of water. Birds are abundant: most conspicuous are the landbirds, primarily passerines on the upreaches and the shore and water birds in the reaches nearest the bay. There is a significant change in species composition throughout the creek. While most species of birds benefit from a reliable stream flow, a few of the more conspicuous species such as the Belted Kingfisher, Black Phoebe, and Spotted Sandpiper, are totally dependent on a live stream or at least a dependable series of good pools in late summer and fall. Management of year-round water levels would thus insure the presence of these species and would also attract heron, egrets, ducks and swallows.

While many amphibians are associated with the creek, due to drought conditions none were seen in the fall of 1977. When the creek contains water, salamanders, frogs, and toads are expected to be abundant. Some species reappear immediately as stream flow returns; others may take months or even a year or two after a dry period to reemerge. Similarly, although many species of reptiles are expected along the creek corridor, only two species of lizards and snakes were observed during the field studies. It is reported that many species of snakes will wander into adjacent yards in search of water when the creek runs dry. There is no evidence that poisonous reptiles inhabit the study area.

The most frequently observed mammals were fox squirrels (exotic but established breeders), and domestic cats. Ground working of the Beechey ground squirrel were evident in all reaches except 7, but ground squirrels were seen only in Reach 3. Ground

cultivation by pocket gophers and moles occurs in all reaches except 7. Smaller rodents appear to be at a population low, probably controlled by the many feral domestic cats which prowl the creek. Deer mice, house mice, and occasional Norway rats are seen.

Several larger wild mammals appear, including raccoons, a few cottontail rabbits, skunks, and an occasional opossum. Grey foxes, badgers, bobcats, coyotes, and black-tailed deer are seldom encountered. Bats are seen seasonally by residents, sometimes in great numbers; while most are probably migrants, some may breed along the creek and in nearby structures.

The following checklist of vertebrates (while not included in this Draft,it is to be reproduced in the final report document) includes the amphibians, reptiles, birds, and mammals which were observed or are expected within the creek corridor. Distribution by reach was derived from the actual observation as well as from literature research and experience in similar habitats in the South San Francisco Bay area. For birds and mammals, a large "X" indicates reaches in which the species is relatively abundant and a small "x" identifies the species as present but uncommon. Field surveys were conducted October 25, November 3, 10 and 26, 1977.

Aquatic Habitat Conditions

Fish life in the upstream portions of the creek was not in evidence due to drought conditions. In those portions of Reach 7 subject to tidal action, two species of bay fishes were collected. The accompanying composite list of collections made by Hasser and Nadler in 1975, by the California Fish and Game in 1976, and by Hasser in 1977, includes fish from the base of the dam to the bay. It demonstrates wet and dry years.

	1975	1976	1977
Rainbow Trout		X	
Sacramento Sucker		X	X
Hitch			X
Carp			X
Goldfish			X
Golden Shiner		X	
Mosquito Fish		X	X
3-Spined Stickleback	X	X	
Riffle Sculpin	X		
Staghorn Sculpin	X		X
Green Sunfish	X		
Bluegill Sunfish	X		
Top Smelt	X		X

The creek provides excellent habitat conditions for fish and offers excellent potential as an anadromous salmonoid or steelhead stream. The entire freshwater stream offers abundant potential salmonoid spawning gravels. A medium-sized gravel spawning material is loose, uncompacted, and relatively clean of algae and silt. The riparian woodland provides suitable shade and shelter in the form of tree roots, logs, undercut banks, and overhanging vines and bushes. Potential salmonoid food is fairly common along the stream's course with the lower, more exposed downstream segment being very productive. Predominant aquatic food supply included stonefly larve, water striders, and the like (Department of Fish and Game, California, 1975). Water pollution does not appear a problem within the creek although oil discharge in the vicinity of Yuba and Church Streets in Reach 4 is evident as well as chemical waste discharge in Reach 5 and washwater wastes in Reach 6. There is also potential for deleterious effects on aquatic life from sanitary landfill leachates in Reach 7.

A desirable object of the plan is to restore the historical role of Stevens Creek as a steelhead spawning stream and fishery. Development of the instream groundwater percolation program to maintain minimum year-round water levels in portions of the creek presents significant opportunity to establish steelhead habitat. Although water releases could not be guaranteed to maintain water in the creek every year, this does not preclude the attainment of a successful spawning habitat. The adult fish population at sea will return when winter rains permit.

The chief obstacle to the restoration of historic steelhead runs in Stevens Creek is the presence of a 12-foot vertical drop structure in Reach 2 which prohibits upstream fish passage. Several other barriers are also present including a 3.5-foot concrete sandbag barrier 60 yards below El Camino Real, several concrete barriers in the vicinity of Central Expressway, small drop structures approximately two-feet-high at Middlefield Road and another of the same height just 50 yards below, and a three-foot drop structure 125 yards above Bayshore Freeway. By providing fishladders in these existing structures and incorporating fish passage mitigations in new structures, steelhead migration upstream will be possible. In addition, small barriers may be overcome by tapering with concrete or building pools to create resting areas which allow fish to get a good start. Resident trout can generally make a single vertical jump of one foot. If a number of jumps are required, these should be limited to a half foot. Steelhead can usually jump to three feet without difficulty where a single barrier is found. Resting pools are needed if the swimming distance is over 50 to 100 feet depending on water velocity. Resting pools are often needed at the upstream end of obstacles so that fish are not swept downstream after making a jump. Other management measures should be undertaken to insure the proper management of the creek as a spawning habitat.

Since the restoration of Stevens Creek is intended as a spawning fishery rather than a recreational resource, consideration should be given to the development of off-stream fishing ponds within the open lands of the creek to serve recreational

interests. The development of small ponds of adequate size and depth to maintain a stocked fishery appears possible; trout are expected to survive in a pond of this type as are sunfish (blue gill, green sunfish, crappy, and black bass), brown bullhead and white catfish. Sunfish can tolerate much higher water temperatures (up to 80 F) and lower dissolved oxygen content (down to two to four ppm). These fish may be established as part of the instream fishery along the stream course.

Managing Biotic Resources

In concert with the above outlined management measures for the aquatic habitat of the creek, a program of conservation and restoration of terrestrial vegetation and wildlife resources should be undertaken to insure the long-range health of the natural area and its enjoyment by urban neighbors. Native woodlands should be protected from further loss and disruption, and riparian trees conserved through a program of vegetative erosion control. Dumping and the discharge of liquid wastes within the creek corridor and on adjacent lands should be prohibited to avoid further damage to vegetation and degradation of the aquatic environment.

Exotic plant species such as pampas grass, reed grass, castor bean, bamboo, ice plant, oleander, broom, etc., should not be planted within the creek and should be removed where they appear. Giant reed should be eradicated where it appears within the creekbed because it spreads rapidly by rhizomes and can severely impede water flow. Eucalyptus trees should be gradually replaces by native woodland spices because the oils they emit and erosion. The stately large trees of the creekway should be periodically inspected to assess the presence of disease and undertake measures to maintain this fine resource. The single most important factor in conserving the vegetation of the creekway is the successful control of motorcycle use which destroys vegetative cover and disrupts soil conditions.

An ambitious program of woodland restoration will repay substantial dividends to the community in the future. In upstream reaches, riparian woodland and oak woodland

restoration proposals are important; marshland restoration proposals in the Bayshore reach are of both local and regional significance. Much of the riparian woodland restoration may occur naturally simply by correcting current management practices which often suppress vegetational growth. All riparian trees establish their place in relation to the creek based on their water needs. Drier bank top and upper bank portions are favored by oaks, bay, and buckeye, while sycamores, alders, box elder, willow, and cottonwoods are found along the lower bank near the water's edge. Where reestablishment of woodland over large areas is desired, the fast-growing riparian trees can achieve relatively rapid results. Direct seeding of woody plants, a technique developed at the University of California, Davis, should be considered. If done in the fall prior to winter rains, seedlings will be well established before the next summer. Native trees successfully grown by this method include big leaf maple, black walnut, box elder, buckeye, live oak and valley oak.

With erosion abatement programs underway, large scale restoration of oak woodlands is envisioned for the largely barren terraces. Restoration here will require more careful planting and management than in the riparian area. Direct seeding techniques may apply; however, irrigation will be important to the initial establishment of young plants. Access should be controlled to prevent disturbance.

Similar measures on the public lands adjacent to the creekway, for example, within the Freeway right of way, will significantly expand and reinforce the visual and environmental character of the creek corridor.

Under present channel conditions within the tidal portions of the creek, marshland restoration opportunities are limited; nonetheless, the marsh species which are established within the channel should be protected. Judicious extension of the salt water marsh within the creek channel maybe coordinated with flood control options involving expansion and variation of the creek channel. Related to the marshland options are opportunities to provide protected bird habitat islands within the channel and in the

adjacent salt ponds; the ponds are protected from wave action and presently serve as roosting, loafing, and nesting grounds for marshland bird life.

Community Environment and Program Elements

Stevens Creek is a valuable open space resource for the urban communities of the Santa Clara Valley. The creek corridor has the potential to provide a variety of exemplary recreational experiences and environmental amentities. This section of the report describes the community framework of the creek setting and defines the program elements by which the natural and cultural features of the creek may serve the residents of the urban area. Included are analyses of land use relationships to the open space of the creek corridor, identification of school facilities within the urban area, and consideration of the following: existing and possible future location of roads and crossing utilities, noise conditions and sources of noise impact, the presence of cultural, archeological and historic resources, and recreational needs and resources within the urban area.

Land Use

The pattern of urban land use surrounding the creek corridor describes the urban, physical and social framework of the creek, indicating the relationship of places where urban residents live, play, work, shop and go to school. In a general way, these patterns illustrate the open space use demand by the urban area. The type and intensity of land use differs from reach to reach. The creek corridor offers rich potential for providing an open space framework within the fragmented urban complex.

Although freeways and major thoroughfares create physical barriers which accentuate the segregation of land use districts and exacerbate community division, the creek corridor enjoys a high level of accessibility which promotes a sense of community identity, because it bisects the east-west arterials of the freeway network.

A mixed land use pattern adjoins the creek corridor including single family and multi-family housing areas, commercial land uses such as shopping centers and other

retail business uses, public uses, especially schools and parklands, and a variety of industrial uses ranging from the Stauffer Chemical Laboratories to greenhouse nursery operations, a sand and gravel works and truck maintenance yards. Vacant parcels are scattered along the creekway with the majority of undeveloped lands in the baylands. "Clean" industrial development such as the electronics firms characteristic of the Santa Clara County is proposed in the baylands area.

Residential land use is characterized by single family neighborhoods in Reaches 1 and 2, a mixed pattern of single and multi-family in Reaches 3 and 4, and a predominant multi-family pattern in Reach 5. The single family areas tend to have a greater amount of neighborhood open space amenities and more direct access to the open space lands of the creek. Direct access to the creek from medium and high density residential areas is often obstructed by the freeway. Due to the lack of available open space in these denser residential neighborhoods, additional pedestrian and vehicular access to the creek is necessary. While the location and density of residential uses adjacent the creek determine the primary potential uses of creek open space resources, the presence of industrial and commercial employment centers in close proximity to the creek points to additional use relationships. Access to the creekway in these areas would make possible noon time recreation or relaxation. Bicycle paths along the creek would offer the opportunity to commute to work from neighboring residential areas. Where work places are immediately adjacent to the creeklands, the stream landscape has potential to enhance existing site amenities.

Commercial land uses are concentrated along two intensive commercial corridors which bisect the creek: the El Camino Real and the Central Expressway commercial strips. Although the El Camino Real corridor functions as the major commercial spine, it lacks a cohesive visual image. The existing trees of the creek corridor appear as a welcome respite to the traveler within this auto-oriented commercial setting. The location of these commercial areas adjacent to the creek also allows for development of

linking bikeways along the creek. Thus the pattern of existing land use and open space resources indicate areas where direct access and recreational use should be encouraged and identify potential linkages between urban land use districts and the natural environment of the creek. From an urban design standpoint, the visual amenities offered by the creek are rich; visual orientation to the open space from within the community may be encouraged by street planting programs, careful siting and scaling of major buildings, and enhancement of linking pedestrian and bicycle systems.

Future development of creek frontage vacant lands, especially within the baylands, can take great advantage of potential open space relationships. Public benefits might include restoration and enhancement of the native vegetation of the creek and creation of additional public access.

At a regional scale, industrial and commercial uses proposed for the baylands, the projected development of the space museum within the NASA-AMES complex at Moffett Field and the gradual expansion and development of Shoreline Park lands into a major regional facility, set the framework for future public use of the creek.

Local Schools

Close proximity of numerous elementary and high schools suggests one of the most significant roles of the creek in serving the community. Creek open spaces provide a variety of sites of natural and cultural interest where local students can apply classroom learning experiences to actual surroundings outside the classroom.

The study area transects Whisman, Mountain View, Los Altos Union, Fremont, the Union School Districts. A total of 42 schools are located within a two mile distance of the creek. Thirty-four elementary schools are included, 23 of which are within a one mile walking distance; three of these adjoin the creek. In addition, there area six senior high schools, four junior high schools, and three private schools within a two mile distance.

The creek has an enormous potential to serve as a nature study area and outdoor classroom and reading facility. Proximity of these creek sites are all the more significant under current financial constraints of local school district.

Needed are integrated curricula which can be shared jointly by the various school districts. These programs could be coordinated with proposed parkland developments and environmental restoration programs within the creekway.

Roads and Crossing Utilities

Investigation of traffic conditions and transportation plans indicates that the grid pattern of regional expressways and local arterials in urban areas south of the Bayshore is fixed with no new crossing road links contemplated. Traffic congestion relief on Stevens Creek Expressway will require increasing the capacity of the road facility. This will be accomplished within the limits of the present right of way with new lanes utilizing the present median. North of the Bayshore within the baylands, a major new road is proposed to serve future industrial development and to provide secondary access to the Moffett Field complex.

Overall, the existing grid pattern of major roadways tends to fragment the urban area. The creek corridor is also fragmented where it is bisected by the Bayshore Freeway, and intermittently by Stevens Creek Expressway, Central Expressway, Moffett Boulevard, the Alviso-Mountain View Expressway, El Camino Real, Fremont Avenue, Homestead Road, and Middlefield Road. The use of the creekway as a utility corridor for PG&E power lines constitutes a major use which dominates the creek landscape visually and controls the pattern of vegetation growth under the powerline. The powerline easement, in some cases, extends the amount of land available for public use. The powerline diverges from the corridor just above El Camino Real. Although existing and planned crossing utilities such as sanitary, sewer, gas, and water lines and communication lines must be accounted for in the location of environmental restoration and recreation sites, most are incorporated within the structure of major bridges and thus do not affect intervening portions of the creekway. Major constraint to vegetation improvement in

Reach 5 is presented by the Hetch Hetchy underground aqueduct which crosses the corridor at Whisman School with an 80-foot right of way. Local storm sewers outfall to the creek throughout all reaches and in some cases create problems of localized bank erosion.

Noise Conditions

The proximity of Stevens Creek Expressway to the creek corridor generates high noise levels which disrupt the atmosphere of peace and quiet desirable within the open space. Noise contour maps depicting the noise levels (measured in decibels) generated by freeway traffic (Noise Element of the Mountain View General Plan, October 1974) indicate that most of the creekway open space lands lie within the 65 to 70 decibel range with portions below the 60 decibel contour and other portions in excess of the 70 decibel contour located immediately adjacent to the freeway. Noise environment guidelines for the City of Mountain View set 55 dB(A) as a desirable noise limit for passive, exterior open space areas. High levels of noise generated by plane landings and take-offs from Moffett Field greatly affect the noise environment of the Baylands.

Noise levels encountered within the creek channel are tolerable due to modification by topography and vegetation of the creek bank. However, in the upper terraces, vegetated noise berms to buffer the open space lands and adjacent residential areas from freeway generated noise would be needed to improve the noise environment. It would be desirable to achieve a maximum sound level of 55 dB(A) within the creekway natural area to enhance its use for nature study, quiet walks, contemplation and relaxation. Earthwork noise barriers would be feasible in places where major topographic changes in landscaping are proposed and warranted in conjunction with land form and woodland restoration.

Cultural Resources

An archaelogical field reconnaissance of the creekway conducted from Homestead Road in Mountain View to the Bay to identify surface evidence of artifactual material

did not reveal evidence of surficial artifactual remains. According to the maps and records on file at the regional archaeological clearing house at Cabrillo College, previous surveys of the project area have not recorded evidence of archaeological remains or prehistoric sites. One site approximately 1/2 mile from the creek has been recorded yet none are indicated which required inspection within the creek corridor.

Despite these findings the creek corridor should be considered a sensitive archaeological resource area due to the presence of a paleolithic site in what is now the Bayshore Park, an Indian village site over 1,000 years old in Santa Cruz Range, and an Indian village site and two large Indian mounds (one now destroyed) in the Moffett Field area.

The traditional and favored position for aboriginal village camp sites would have been near the bay where the Moffett Field sites are located and at the southern edge of the project in the vicinity of Homestead Road where the availability of water, shelter from the wind, oak groves, and nearby deer hunting areas would have supported a village which could also exploit nearby bay resources. It is likely the flats on either side of the creek might yield sites of Indian artifacts and may contain yet undiscovered remains. Although little can be said by archeologists about these areas because early farming, earth moving, and urban development has covered up or destroyed most of the old Indian encampments by the time the first surveys of the bay margins were made in 1907, the potential for discovering archeological remains is high.

It is impractical to conduct a more intensive subsurface inspection of open lands within the creek corridor to detect the presence of artifactual sites. Specific subsurface testing should be conducted where major construction or earth moving site preparation is planned for specific flood control projects which extend beyond the immediate limits of the creek banks. Where remains are covered, projects should be designed to protect archaeological materials and avoid their destruction. Large scale earth moving activities should also be monitored by a qualified archaeologist to determine whether any

archaeological materials are unearthed during construction. Should archaeological materials be uncovered, construction should be delayed until plans for the preservation or removal of artifacts is made in concurrence with concerned members of the Ohlone Tribe or representatives of the Northwestern Indians Cemetary Protection Association.

The full length of Stevens Creek was declared a State Historic Landmark by the California Historical Landmarks Advisory Committee in 1964. The designation commemorates two encampments of Colonel Juan Bautista de Anza initially while exploring the bay region to establish the Mission Dolores, San Francisco, and later, in 1776, while establishing the Presidio settlement in San Francisco. The latter encampment was made in the area that is now Stevens Creek Boulevard and McClellan Road. Further south of the study area along Stevens Creek is the site of Captain Elisha Stevens' home, after whom the creek is named. Toward the bay is the site of the Rengstorff house and boat landing which is on of the National Historic Register. The City of Mountain View plans to relocate the Rengstorff House to nearby Shoreline Park. Because of the presence of these points of historical significance it would be desirable to utilize historical themes in programming major public recreational use areas.

Recreation Resources and Uses

The creekway can serve local community and regional recreational activities consistent with its natural resources and by responding to the demand for multiple recreational opportunities within the urban community.

Trends in national, state and local recreation habits reveal that public demands for recreation facilities is focusing on just those resources and recreational features that the creekway can provide. The National Urban Recreation Study, (1978), concluded that "people in all urban areas want a well-balanced system of urban recreation opportunities which includes close to home neighborhood facilities and programs for all segments of the population". The trend of Federal and State policy is toward meeting urban recreational parkland needs within the urban area rather than in outlying locations. A

number of factors including energy price constraints on travel, general inflation and increasing family recreation budgets, and increasing urban populations and density, are likely to contribute to a long-term emphasis on increasing the mix of recreational opportunities in urban centers.

Local demand for open space recreational resources may be assessed from several standpoints. Forecast of recreational activity of the people of Santa Clara County (Arthur D. Little, Inc., 1969) determined that the activity with the greatest participation on a weekday for the population as a whole is walking and hiking, followed by driving for pleasure and bicycling and unstructured activities. On the weekend, driving for pleasure is the most popular, yet walking and hiking in suburban areas is ranked a close second with unstructured activities third, and swimming and bicycling closely following. Among students under age 18, pleasure driving was most important for weekday and weekend activity. However, walking and hiking came in a close second on the weekend and third during the weekdays, while bicycling ranked higher on weekdays then it did on a weekend (second and third). Demand for all activities was projected to increase substantially according to the same ranking of preference and was expected to be stronger in the spring than in the fall. The continued availability of ample gasoline is now in question. This will undoubtedly reduce pleasure driving and create a high demand for walking, hiking and bicycling activities. The creekway is well suited to answer the increasing demand for walking, hiking, bicycling and unstructured activities as well as such activities as picnicking and fishing which are ranked lower in preference but nonetheless have a high projected public demand.

The pattern of residential land use adjacent to the creek corridor, in particular the high density residential uses, along the northern reaches of the creek, indicates the need for increasing the supply and avialability of open space. Residents of multi-family apartment comlexes represent an important user population within the service area of the creek due to the limited amount of outside recreational amenities and available park lands. The City of Mountain View General Plan identifies several neighborhood areas

adjacent to the creek as deficient in neighborhood park space. (Neighborhood park space is defined as recreation facilities available within a quarter mile walking distance, while district parks fall within a one mile walking distance.) This need for park space occurs in neighborhoods from El Camino north to the Bayshore and is particularly apparent in the vicinity of Whisman School area. Thus a high level of recreational use demand can be expected of the creek open space within these areas. Importantly, the ability to fulfill these recreational demands varies throughout the creekway, as do the nature and level of the demands themselves. Viewed in light of city-wide needs for district-level and regional facilities, neighborhood parks and mini-parklets, the creekway can contribute to the proper balance of urban recreational opportunities. Part of this desire to provide an evenly balanced program of urban recreational uses is an awareness that recreational facilities must adequately accommodate the variety of use groups, especially the needs of the physically and emotionally handicapped. The diversity of the creek corridor broadens the user service capability of the creekway and proper programming and supervision of recreational uses can increase the availability of the creek for handicapped users.

Proposed Recreational Activities

Consistent with the existing policies of communities adjacent to the creekway, it is recommended that the open spaces of the corridor be developed as a continuous chain of parklands with major recreational use areas and supporting facilities clustered at planned locations along the corridor for ease of management. Recreational uses should be programmed so that they augment and provide a framework for regional, urban and neighborhood park and recreational activities. Outdoor recreational activities should be emphasized which are compatible with the natural environment and insure the conservation and enhancement of the natural area.

A variety of recreational activities forms the building blocks of the recreational program. These have been selected either as derived from existing recreational program policy and current activities or as recommended by representatives of local user groups

and residents of neighborhoods adjacent to the creekway, or because they are intrinsic to the natural resources of the creek. The mix of future activities envisioned for the creekway in its various reaches includes jogging trails and exercise courses, bikeways within the creekway connected to adjacent bikelanes along roadways, strolling and hiking opportunities, off-stream and bayshore fishing activities, unstructured nature study, picnicking facilities, and day-use areas for groups such as scouting organizations.

Jogging Trails and Exercise Courses

Local residents desiring to use the creek open space as a place to conduct daily exercise routines may jog along bicycle trails in some areas or use measured jogging routes which follow loop trails. These might be connected to existing neighborhoods via designated jogging routes the same way that bikelanes are set aside. The combined system will afford residents both long and short distance jogging routes within both neighborhood and natural settings. Where neighborhood parks are recommended for intensive recreational activities, exercise facilities such as "par courses" or "vita-courses" may be provided to permit an expanded physical fitness program.

Bikeways and Lanes

Bicycling is becoming a primary mode of recreation and an alternative mode of transportation for both adults and children. The proposed creekway bicycle trail will fill gaps in bikelanes within the urban area and improve bicycling commute routes, including feeder routes to transit systems, as well as improving access to recreational destinations. A six-foot-wide bituminous bikeway facility should be installed along the recommended route with a two to four foot gravel apron for pedistrians and hikers. Supporting facilities should include narrower trail loops, rest areas, and picnic facilities installed where they can be combined with public schools and recreational centers. Maps and guides for routes and facilities should be publicized to stimulate community use.

Strolling and Hiking

Short casual strolls within a natural environment is a close-to-home recreational opportunity desired by young and old alike. Opportunity for more rigorous, longer hikes

is also afforded by the creek corridor. It is possible to tie a Stevens Creek Park to the Baylands Trail south of the City of Mountain View. Pedestrian access to regional and local trail systems should be limited to designated access points compatible with adjacent land uses; access should be prohibited to unauthorized motorized vehicles.

Fishing

Recreational fishing is traditionally a popular activity of both adults and school children, yet is one of the most limited recreational resources within South Bay communities. Artificial off-stream fishing ponds could be developed adjacent to the stream, especially in areas close to existing schools to provide year-round recreational fishing. Bay water fishing could also be encouraged in the future within tidal portions of the stream channel by providing fishing piers or platforms. Properly designed fishing ponds may be capable of supporting a permanent fish population, but a regular stocking program may be needed to meet recreational demand on the fishery. However, it would be impractical to attempt to develop the creek itself as a fishing resource.

Nature Study and Landscape Appreciation

The creek natural area is well suited to provide an outdoor environmental curricula to local schools. The corridor offers a ready-made exhibit of natural processes, flora and fauna. Landscape appreciation as a less formal activity is available to local residents who take the opportunity to walk though the creek landscape. Formal nature study opportunities and programs can be developed within any reach which best serves adjacent local schools; coordinated use by schools and school districts should be encouraged. Opportunity for landscape appreciation will be enhanced throughout the creek corridor by natural area conservation and restoration recommendations.

Nature Center

An interpretive nature center is essential to encourage public appreciation of the creek corridor and the baylands environment. The plan recommends a center in the northeast corner of Shoreline Park which could serve as a general study facility for the entire creekway as well as an orientation point for interpretive boardwalks and trails

within the baylands area. Fields of study might include the land use geomorphic history of the creek, indicating historic and prehistoric features, and an introduction to the plant and wildlife communities or the creekway. Adequate space should be provided for formal public instruction and study groups as well as facilities aiding self-guided public use. Supporting facilities should include boardwalks within marshland areas similar to those developed in the Palo Alto baylands, viewing platforms and photography blinds, as well as pedestrian, bicycle and vehicular access and parking facilities.

Picnicking

Urban parks throughout the Bay Area often experience crowded picnic areas. The proximity of the creekway natural landscape to dense residential areas increases the desirability of informal picnicking. Picnic facilities planned for the Whisman School area could be expanded over time according to local demand to take advantage of sites closely oriented to the creek. Formal picnic facilities including tables, barbecue boxes, trash containers, and pedestrian walkways could be developed in more intensive use areas. Throughout the creek, however, a restored natural landscape is expected to be conducive to more active public use including picnicking.

Group Day Use Area

Day use areas which afford organized outdoor and similar groups the opportunity to assemble for special events, such as rallies, exhibit activities, without elaborate travel requirements, are increasingly desireable within urban areas. Several sites within the creek area are recommended for this type of group use. Use by responsible groups such as the Boy Scouts, Girl Scouts, Campfire Girls, and 4-H Clubs will also promote conservation and proper management of the creekway.

THE RECOMMENDED PHYSICAL PLAN

THE RECOMMENDED PHYSICAL PLAN

Organization of the Plan

The desire to conserve and restore Stevens Creek as an urban natural area while allowing for use of a wide variety of close-to-home recreational opportunities serving neighborhood, community, and regional needs, requires a well-organized physical plan. Analysis of the urban setting and natural resource conditions reveals a pattern of environmental and community needs and site opportunities which give form to the proposed plan. Several planning concepts and principles clarify the plan framework:

Park Chain Concept of Use Distribution

The varying pattern of environmental and community conditions along the linear corridor allows for logical distribution of uses according to a system of parkland nodes and intervening links. Nodes represent areas where activities are clustered or where a unifying theme of special interest is noted. Where parkland nodes may provide intensive, people-oriented uses, they allow more efficient management and maintenance of the area. Correspondingly, recreational activities requiring a higher degree of park management should be clustered in people-oriented activity nodes. Where an open space-oriented node is indicated, a unified concept of resource management and use is applied.

Community Open Space Framework Concept

The meandering course of the creek bisects numerous land use districts, neighborhoods, and communities. Thus, the continuous system of creekside public lands has the potential to form an integrating open space framework which can reunite fragmented portions of the urban area. This approach can link neighborhoods now divided by the freeway, and permit a consolidated network of community use and institutional areas, parks and parklets, scenic backdrops, bikeways and interconnecting walkways to unify recreation and open space resources within the urban area.

Recreational Use Compatibility and Controlled Access

The magnitude and intensity of public recreational activity and the community service area of a reach of parkland should be guided by the sensitivity of environmental conditions within the reach and the compatibility of adjacent land uses. Service level may range from micro-neighborhood, neighborhood, community, regional.

Although access should be controlled throughout the corridor to curb motorcycle access and abuse of the creekside landscape, a program of two levels of access restriction is delineated to support the management objective within each reach. A program of Restricted Access is proposed for Reaches 1 and 2 where access is limited to supervised school or youth groups or a designated community group use. Controlled Public Access is designated for Reaches 3, 4, 5, 6, and 7 whereby access points are regulated to limit access to pedestrians and bicyclists.

Consistent with this system of controlled access, the improved creekside portion of the continuous Bay to foothills trailway is designated for the Controlled Access Reaches 3 through 7, from Bayshore in the City of Mountain View to the Baywaters. The creekside trail proposal includes provisions for connections to local on-street bike lanes and ways.

Two-Level Plan

The Plan is presented in two levels. The Basic Plan, which is illustrated for each reach, proposes necessary actions to improve and restore the physical resources and sets forth compatible activities and levels of community use. Future Options, which are identified in a few reaches, represent project opportunities which may not be feasible or needed now, but should be retained for future consideration.

Summary of the Recommended Plan

The accompanying diagram (at the back of this report) illustrates the proposed plan. Briefly, it is recommended that a variety of natural resource and recreational roles be served by the various reaches in the creek corridor.

Reach 1 - Homestead Road to Highway 85

Reach 1 is envisioned as a woodland aquatic habitat preserve in which the magnificent environmental features within the reach are protected to provide a fish spawning and nursery habitat within the stream and a supervised school-based nature study program. A structural setback line on each bank is proposed in this and following reaches to regulate new construction commensurate with the stability zone of the banks.

Reach 2 - Highway 85 to Brook Place

Reach 2 is envisioned as a greenbelt link within the creek corridor in which substantial land form and woodland restoration is employed to reverse the severe deterioration of the natural area. Enhancement of greenbelt qualities will provide scenic backdrop to the urban area while permitting a controlled community group use program capable of managing public land resources while insuring compatibility with adjacent residential properties. In time, the restoration of Reach 2 would permit the extension of Reach 1's aquatic habitat. Since both reaches are within the groundwater percolation areas of the controlled reservoir release program, it may be possible to maintain minimum water levels within these two reaches on a year-round basis. Access would be restricted in both reaches.

Reach 3 - Brook Place to El Camino Real

Reach 3 is envisioned as a major parkland node within the park chain permitting community-oriented open space use. Conservation of the remaining woodland resources and restoration of the creek banks and woodland where severe deterioration has occurred is recommended. Under the proposed basic plan, community access should be achieved from Brook Place and from a freeway overpass linking the proposed Dale Avenue Neighborhood Park. Uses would include nature exploration, strolling, walking, bicycle trail use, and jogging. An option for the future should consider the development of a larger open space park expanded to the west bank allowing for more intensive "people-oriented" uses. Proposed enhancement of the creekland calls for widening a badly eroded

channel portion to create a central water feature which focuses the parkland landscape and eases downstream flow velocities and water levels during flood conditions. The formal creekside trail would begin in this reach, from Brook Place proceeding northward to the Bay.

Reach 4 - El Camino Real to Highway 85

Reach 4 is envisioned as a linking reach providing a series of small parklets serving the immediate adjacent neighborhoods. Various woodland conservation, erosion reduction and flood protection measures are called for.

Reach 5 - Highway 85 to Bayshore Freeway (Highway 101)

It is recommended that Reach 5 be developed as a neighborhood recreation parkland node, providing passive and active recreational space, much needed in this intensively developed portion of the urban area. Flood protection measures are required. Landform and vegetation restoration actions are proposed within the creekside open space lands to serve purposes which emphasize development of active recreation using Whisman School facilities as a staging area. A significant future option includes suggested development of an off-stream recreational pond within the open space for use by the local neighborhood.

Reach 6 - Highway 101 to Crittenden Lane

Within the Baylands, environmental and urban conditions are dramatically different from the upstream portions of the creek. Due to the environmental and recreational opportunities present within Reach 7, it is recommended that Reach 6 be viewed simply as a linking corridor which provides for an attractive trailway on the westside levee of the creek enabling trail users to proceed toward bayfront destinations. Levee improvements are needed to control the threat of flooding.

Reach 7 - the Bayfront Parkland, Crittenden Lane to Bay

Reach 7 provides a significant opportunity to achieve bayfront access within an environmental and recreational framework. Creek channel modifications required for

flood control purposes offer an exciting opportunity to revitalize the Shoreline Park Plan by providing a new creek-oriented component. The basic plan proposes reorientation of the east of Shoreline Park toward Stevens Creek to achieve an "in-channel" concept of increased environmental and recreational benefits. To make this possible, a revised curvilinear design for the creek channel levees is recommended encompassing both the marshland restoration area within the Shoreline Park plan and the new 54-acre marshland preserve of the Midpeninsula Regional Open Space District. To reinforce this concept, it is recommended that visitor access be provided by a new road within Shoreline Park to a proposed visitor interpretative center which is sited for optimum development of the creek component.

An option should be considered in the future which extends the "in-channel" program of increased environmental and recreation benefits along the channel extension to the Bay with increased public access and use possibilities. Under both concepts, Stevens Creek can serve as a major bayfront access arm of Shoreline Park.

The Plan

Reach 1: Homestead Road to Highway 85: Woodland and Aquatic Habitat Preserve

This reach contains a magnificent, highly developed riparian woodland habitat. Because it is also an area of controlled in-stream, groundwater percolation, the reach has the potential for development of a productive, aquatic environmental preserve. Natural meanders and gentle channel conditions, enhance the present variety of plant and animal life. Historically, this reach was an ideal steelhead spawning ground until drop-structures interfered with upstream fish migration. Pollution of the Bay also contributed to the loss of steelhead fishery.

Reach 1 naturally lends itself to the preservation and management of its ecological system and use for a supervised nature study program which is compatible with adjacent residential areas.

The Urban Setting

This reach is bounded by Homestead Road on the south and Stevens Creek Freeway just north of Fremont Avenue on the north. Other than these two roads, no major arterials traverse the area. Reach 1 is the only reach upstream of Bayshore in which Stevens Creek Freeway does not parallel the creek, thus preserving a more peaceful, noise-free environment.

Single family homes flank most of the creek; apartments are found south of West Valley School and the Stauffer Chemical Company at Fremont Avenue. Portions of the creek channel are in private ownership where houses back onto the creek and property lines extend to the center of the streambed. Approximately eleven acres are publicly owned.

Four schools are located within one-quarter mile. San Antonio Elementary School and Cupertino Junior High School are located east of Stevens Creek Freeway, which acts as a barrier to creek access, although the Dalles to Holt Avenue overcrossing permits pedestrian and bicycle access. Grant Elementary School is within three blocks and West Valley Elementary School adjoins the creek.

The West Valley playing field offers the only recreational facilities in the vicinity of the creek and permits direct access to the creek. There is no other formal vehicular parking or pedestrian access. The creek can be crossed via a footbridge at the northern end of the West Valley schoolground.

The creek roughly parallels the boundary between Los Altos to the west and Sunnyvale to the east. Homestead Road is the border for the City of Cupertino to the south.

The Creek Environment

Geology. The channel in this Reach is not sharply incised, averaging 20-feet-deep, with gradually sloping banks offering fairly easy access to portions of the streambed. However, the homes encroaching upon the banks

combined with a relatively dense vegetative understory make access difficult.

The Cascade earth fault trace crosses the creek in the vicinity of Dalles Avenue.

The creek bed is wide and open, laced with rocky pools, cobbles, and gravelly beds. Because of the deep gravels present, this reach is a critical recharge zone where controlled water released may percolate into the groundwater table to prevent further land subsidence in the flat lands close to the Bay.

Erosion. A moderate amount of bank and tree undercutting occurs, some caused by stream activity. Most of these unstable areas, however, show evidence of landslides. There are four identified zones of erosion that require immediate remedial action as shown on the plans, although it need not be structural.

Flooding. The channel in this reach is adequate to contain all natural flooding; the only instance in which the banks might be overtopped would be if Stevens Creek Dam were to rupture when it was full.

Vegetation. A wide band of lush, mature riparian vegetation with many large buckeyes, oaks, and cottonwoods lines the channel. Sycamores are found along the curving stream bank where their exposed lattice-like root systems serve to control bank erosion. The creek bed itself is largely devoid of vegetation but overhanging trees provide shade and cover for aquatic life.

Introduced plants, such as the giant reed, create management problems since these weedy species are invasive and rapidly choke the streambed. In some places the understory has been disturbed by dumping, clearing, or gardening. The West Valley School follows the practice of eradicating foliage along their grounds that border the creek. This not only

destroys vegetation but leaches potentially toxic substances into the estuarine environment.

Wildlife. Although the expected amphibian, reptile, and mammal species (salamanders, snakes, raccoons, and squirrels) associated with the creek environments are present in abundance, the most conspicuous creatures in this reach are land birds. Concentration of sparrows, hummingbirds, chickadees, titmice, and towhees are present in larger than usual numbers, partially because of a conducive habitat, partially because they are fed.

The Proposed Program

The program for Reach 1 includes managing it as an environmental preserve, controlling access while allowing organized nature study, and renewing the steelhead nursery resource.

Woodland Management. Undertake remedial measures to control root undermining of mature trees and plant native tree seedlings where appropriate to insure woodland replenishment.

Re-establish the vegetative understory where disturbed in order to enchance existing vegetation and control bank erosion.

Incease the riparian buffer at the western edge of West Valley schoolgrounds from the playing field to the creek by planting trees and shrubs.

Fishery Restoration. Keep the creek filled with at least four to six inches of water, especially in pools.

Increase the vegetative canopy for shade and protective cover.

Plant steelhead fingerlings in this and selected southerly portions to establish a spawning fishery.

Manage water levels not only for steelhead fingerlings, but also to attract those birds dependent upon a live stream.

Controlled Access and Nature Study Use. Route the county hiking trail around the area thereby minimizing potential ecological impacts and preserving the privacy of property owners adjacent to the creek.

Utilize the aquatic and terrestrial habitats for environmental education purposes but confine access to these nature study areas to local schoolchildren.

Flood and Erosion Control. No flood control improvements are necessary due to the adequate capacity of the stream to carry the one percent flood.

Construction sacked concrete lining erosion controls at two storm drain outfall locations.

Provide two additional access ramps to facilitate maintenance activities.

Provide for reinforcement and root armoring of riparian trees undergoing erosive undercutting on an "as required" basis. Undertake vegetative erosion control measures on exposed banks.

Reach 2: Highway 85 to Brook Place: Greenbelt Restoration Link

The objectives of the Reach 2 proposals are to reverse vegetation deterioration and severe erosion by undertaking long term greenbelt restoration for the enjoyment of the immediate neighborhoods. A controlled community use program is emphasized to encourage responsible land management and ensure compatibility with adjacent residential properties.

The Urban Setting

The 5,800-foot-long Reach runs parallel and east of the Expressway from a point in Sunnyvale north of Fremont Avenue, where the creek undercrosses to the east, to a point below Brook Place in Mountain View where the creek undercrosses back to the west. Single-family residential is the primary land use neighboring the reach. The only major arterial is Remington Drive, which dead ends at the eastern bank.

A total of ten schools flank this reach within a mile distance. Five schools are located within one-half mile of the creek, although Awalt Senior High School and Oak Avenue Elementary School are on the west side of the freeway, effectively barred from convenient access. On the east side, are DeAnza and Cherry Chase Elementary Schools, both within one-third mile proximity, and Mango Junior High School, one-third of a mile away. Within a half mile to one mile on the east side are Pippin and Cumberland Elementary Schools. Carmel and Loyola Elementary Schools are one mile to the west as is Black Junior High School. There are no recreational facilities in the reach other than a small park asociated with DeAnza and the playfields adjacent to Awalt High School.

The open lands within this reach are of good size, amounting to approximately 17 acres. California Water Company owns nearly one acre toward the south and the Cities of Mountain View and Sunnyvale own the balance. Access is difficult, however, with Mountain View neighborhoods to the west barred by the freeway and access for Sunnyvale neighborhoods to the east poorly defined or in conflict with private residences.

The Creek Environment

Geology. The southern part of this reach is similar to Reach 1 with well-developed meanders, a channel depth of 25 feet, and moderate slopes. As it moves north, however, the channel changes character: the stream deepens to 35-40 feet, the walls steepen and narrow, and the stream course is somewhat straighter.

Erosion. This reach has some of the most severe creek bank stability and erosion problems of the entire creek. Soil borings at the northern end encountered silts up to six feet thick which are easily eroded when exposed. Seven major unstable zones at the outside of curves were identified in field surveys. At one location the stream is undercutting a slope nearly 40-feet-high. Other unstable zones are noted by near vertical slopes above steep talus deposits at the toe.

Flooding. Because of the steep banks, the creek has adequate capacity to carry the one percent flood. Thus, flooding does not pose a threat in this reach.

Vegetation. Extensive areas of exposed soils and intermittant grassland are found, undoubtedly created by the removal of soil materials for roadbuilding purposes and motorcycle usage. Scattered sycamore, oak, and cottonwood are present along the creek, but sycamores wane as the creek channel narrows and steepens, removing the gentle slopes on which they anchor their roots. Although there are a few stands of native trees, most are small and scattered; understory is highly disturbed.

Wildlife. Some animals typical of a riparian habitat may be found in Reach 2, as they are in Reaches 1 and 3. Species populations may be expected to be lower due to the disturbed quality of the setting.

The Proposed Program

Reach 2 suffers from two severe and interrelated problems: drastic bank erosion and frequent motorcycle use. Because the lands bordering the creek are open grasslands, they appeal to motorcyclists; heavy use of the area has resulted in the loss of a vegetative understory that would normally control erosion. The unrestricted use of motorcycles also disturbs adjacent homeowners, disrupts wildlife, and precludes revegetation. The program for this reach emphasizes controlled use and large-scale greenbelt restoration and enhancement.

Controlled Community Group Use. The development of public uses which are compatible with adjoining residential areas and at the same time replenish the woodland environment can best be accomplished by authorizing responsible community groups to exercise long-term permits for designated uses and land management. Such group involvement might include community gardens, nature study and outdoor classrooms for school students,

or scouting day-use areas where youngsters might camp on weekends and could, in fact, be responsible for the reforestation of the area through a continuing ecology project.

As part of this use authorization, entry points would be gated and access restricted only to designated group users' service and emergency vehicles. The primary entrance would be at the creek end of Remington Drive. Off-street parking would be encouraged in the graveled area beneath the PG&E transmission towers but would be fences with a locked gate with keys restricted to authorized user groups.

Oak Woodland Restoration and Landform Contouring. Regrade major portions of the stream side terraces to reduce the steep banks and instability and create a landform conducive to establishing a stream side wooded environment. Spoils from earth work could be aligned where possible along the freeway to provide an earth berm noise barrier.

Utilize mass vegetative planting techniques to initiate woody plant revegetation of the reworked terraces. Restrict access and provide for long-term cultivation of the restored oak woodland.

Aquatic Habitat Restoration. Restore and manage the reach as a nursery fishery.

Provide a fish ladder for the 12-foot-high drop structure at southern end of reach.

Re-establish a dense riparian woodland where feasible along the creek.

Maintain minimum water depths as provided by the percolation program to sustain fishlife during the summer carry-over period.

Flood and Erosion Control No flood control improvements are needed.

Various erosion protection measures are proposed along the creekside slopes to prevent further erosion consisting of rock, sacked concrete, and grouted rock lining.

Reach 3: Brook Place to El Camino Real: Community Nature Parkland

This reach offers great potential as a nodal community parkland situated in a key area of urban need. A restored and expanded natural area can offer welcome green space to relieve the intensive urban character associated with the El Camino corridor. In addition, improved recreation resources and user access can provide a meaningful link between city neighborhoods now divided by the Freeway.

Many existing conditions represent liabilities which need to be turned into landscape assets. The remaining riparian woodland, clinging precariously to the steep, unstable bluffs overlooking the creek, will benefit from maintenace rock lining at the toe of these banks and new plantings to increase the woodland size. Where bank sloughing has already been substantial, creating great loss of trees, the opportunity offered is to reform the bank landform into a series of gentle terraces focusing on a widened creek bed in which a new stream environment can be created to serve habitat and recreational purposes.

The Urban Setting

The 5,000-foot-long Reach extends along Highway 85 near Brook Place to El Camino Real running parallel and west of the freeway. The City of Mountain View owns nearly 20 of the approximately 23 acres of creekside public lands. The adjacent highway interchange contributes visually to the open land character.

The surrounding land uses are highly mixed: a mobile home park, nursery greenhouses, a drive-in theater, shopping center, and single family neighborhoods are located on the west side of the creek. The area to the east, which is physically barred from the creek by the Freeway is primarily multi-family residential. El Camino Real, which forms the northern Reach boundary, is an extensive commercial use corridor.

Seven Schools are within two miles of the reach. On the westerly, more accessible side, Huff and Bubb Elementary Schools are the closest, within a quarter mile and half mile walking distance respectively. St. Francis High School at one mile, Springer Elementary School, one and one-half miles, St. William School, two miles and Cumberland Elementary School is two miles to the east; although streetside walking routes are circuitous, it is in a direct line of a major power easement connecting to the creek corridor.

Recreational facilities are abundant to the west of the reach and to the east. Cuesta Park, a large district level facility is a mile west; another small park is a half mile west on Chelsea Avenue, and a small areas known as Brook Place Park is on the creek itself. However, the latter is undeveloped except for a stair leading to the creek. The City of Mountain View proposes to develop the Dale Avenue Neighborhood Park to the east across the expressway. The park is badly needed due to the dearth of park space in the eastern high density neighborhoods and the freeway barrier to the creek.

The Creek Environment

Geology. At the southerly edge of the Reach, the stream channel makes a large, wide turn, forming a wide floodplain at Brook Place Park; from there the channel is narrow and deep, ranging from 30 to 36 feet in height with sidewalls that vary from about 1:5 to vertical. Toward the middle and northern portion of the reach, the streambed proceeds to braid, creating new meanders within a wide channel bottom. Toward El Camino, a relatively narrow and gently curving channel pattern returns. The soils in the west bank are the same clay loams found in Reach 2; gravelly loam is found on the east bank. Groundwater is generally encountered at or below 40 feet in this area but the slopes along Diericx Drive and Franklin Avenue have some moisture resulting from the use of septic tanks and leach fields which can contribute to the susceptibility of subsurface materials to slide. The stream

banks along much of the reach are very steep to vertical, forming steep bluffs, often with debris at the base. The Santa Clara earth fault trace crosses the reach in line with Heatherstone Way.

Erosion. Six sections of stream bank along the west have been classified as unstable, and four on the east bank. Seven power transmission poles are in unstable bank areas within the building control lines. One unstable area adjacent to Diericx Drive and Franklin Avenue has been protected by a placement of large size riprap at about one to one slope. The Santa Clara Valley Water District has identified 25 properties on the west bank in Reach 3 to be purchased by the District as each owner desires to sell. This is a continuing program started in 1974, and is seen as the most economical and environmentally sensitive solution to the bank stability program. Two homes have also been purchased and removed from along Diericx Drive where threatened by streambank instability. The bluffs are composed generally of stiff silty and sandy clays with sandy clay layers, however, at about the elevation of the streambank, cohesionless fine to coarse sand with fine to coarse gravels is encountered which are highly erodable and, where exposed, are readily undercut by the stream.

Flooding. Due to the size and depth of the stream channel, flood flows from the one percent flood would be contained, thus eliminating flooding problems to adjacent land areas.

Vegetation. Subtle differences distinguish the riparian woodlands found within this reach from previous reaches. Sycamores no longer appear in the niches close to the water; in one place young alder are found growing on the river bars.

The steep upper bluffs are lined by an older well-mixed community of cottonwoods, oaks and willows and subordinate numbers of walnut, locust, as

well as toyon and blackberry. However, erosion threatens to topple many of these trees; one stretch of woodland has already been lost to bank sliding in the vicinity of the nursery greenhouses. A few valley oaks are found, especially back from the riparian woodland along the dry upper grasslands. Their presence, no doubt, represents the remnant of the former oak woodlands found extensively throughout the valley. Numerous eucalyptus are found in the Brook Place Park floodplain. Although a mature, dominant stand, they tend to crowd out native trees and plant species. Giant reed (Arundo donax) appears in some spots within the channel, creating potential problems for stream flow.

Wildlife. Aside from the majority of riparian wildlife species ranging from Reaches 1 to 5, this Reach appears to represent a transition zone for some species associated with Reaches 1 and 2 and those tending toward northerly reaches. Certain species of newts and salamanders, for instance, are present in this and southerly Reaches yet do not appear within northerly Reaches. On the other hand, bull frogs, leopard frogs and Western pond turtles are found north of this Reach. Less common species of lizards and reptiles also follow this habitat pattern.

Interestingly, Reach 3 appears to be the upstream limit of such bay-oriented birds as the Great Blue Heron and Black-crowned Night Heron, whereas Reach 4 appears to be the limit of the mallard and wood duck. Other amphibians, reptiles, birds, and mammals typical of riparian woodlands are present within the Reach.

The Proposed Program

Two levels of parkland development are possible:

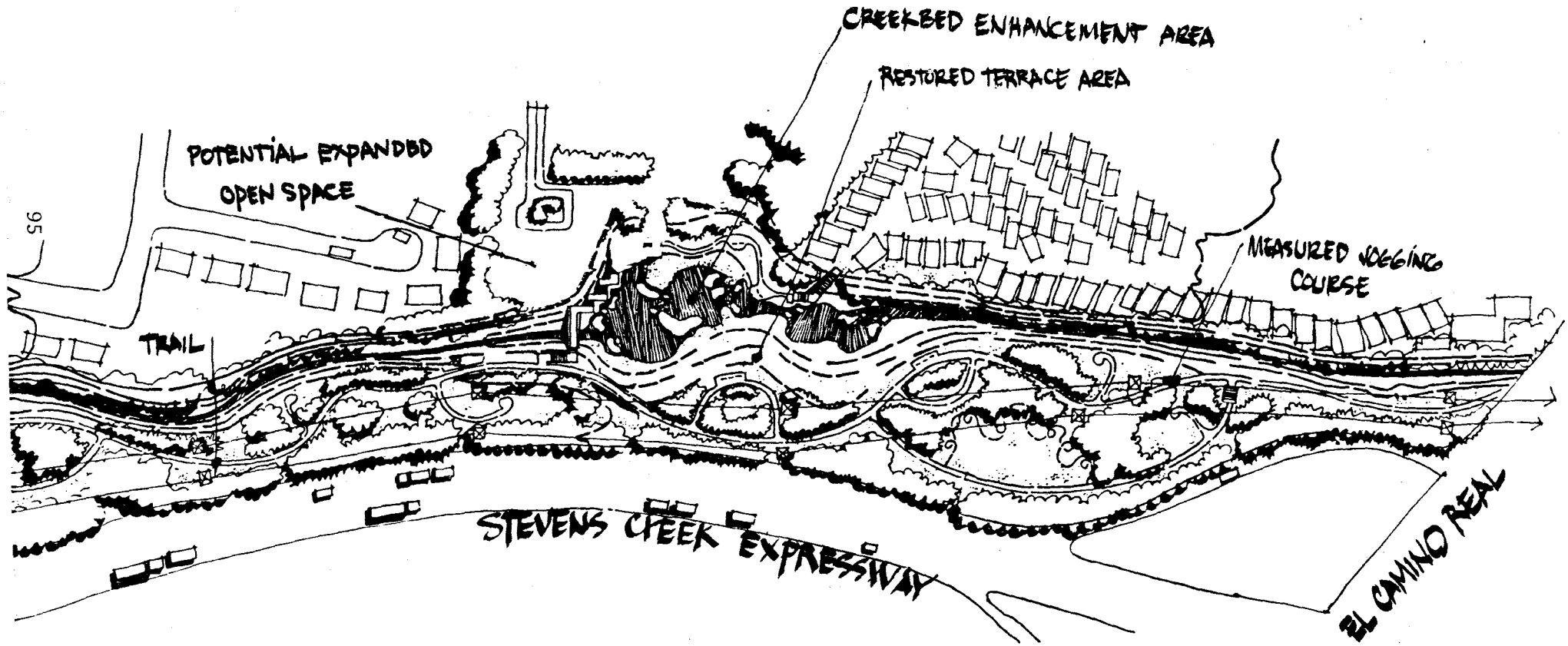
The Recommended Basic Plan. Improvements are set forth for the east side of the creek which would transform the landform into a more stable terrace

area upon which restoration of a new oak woodland is envisioned. This represents a resource-oriented approach in which recreation activities would remain largely passive, yet with increased nature study opportunities and improved access to the proposed Dale Avenue Neighborhood Park across the freeway via a pedestrian overpass. Open public use should be encouraged in this areas, especially in the northerly portions between the creek and the freeway. Reach 3 should also serve as the initial segment of the creekside bicycle trail. A major jogging course is also proposed which could be fed by routes in adjacent neighborhoods. Due to the location of some power line towers in unstable areas, power line relocation appears necessary as well as desirable from the standpoint of achieving recommended landscape improvements.

Future Plan Options. A second level of development is illustrated in the Future Option sketch in which the basic improvements recommended for the east bank are incorporated into a larger open space park concept utilizing the west bank as well. The opportunity to pursue this option lies in future land use changes which may ocur if the commercial nursery yields to pressure for more intensive urban development. On a longer term basis, the same possibility may hold true for the mobile home park to the north of the nursery. Should a proposal for new development of the nursery lands arise, steps should be taken to consider development of a portion of this land to achieve an expanded open space facility with improved access from local streets.

The elements of the recommended Basic Plan include:

Trail Use and Access. An all-weather trail should be developed which starts at the Brook Place Park where it would link up to bicycle lanes within adjacent neighborhoods to the west and proceed along the east side of the



REACH 3: COMMUNITY NATURE PARKLAND, FUTURE OPTION SKETCH

creek in a meandering course northward. The trail would exit at the El Camino bridge and proceed westward along the El Camino to the traffic light; crossing El Camino to follow a route around the initial segment of Reach 4. A pedestrian overpass should be provided to link to future Dale Avenue Neighborhood Park and provide a major access point for easterly neighborhoods. A set of steps should also be provided for the elderly who reside in the mobile home park near El Camino Real.

Landform Modification and Woodland Restoration. Large scale grading should be undertaken to remove eroding bluffs and create a more gentle sloping landform focusing on the creek as shown. A large scale restoration program is recommended in which riparian woodland and oak woodland are expanded to encompass most of the publicly owned open lands. As part of this program, excess soil removed from the terrace regarding will be placed in a continuous planted earth berm along the freeway to screen freeway noise and create a quieter environment. Weedy plants, including giant reed within the creek bed, should be removed as well as other exotics and a special program to phase out eucalyptus trees within the Brook Place area and revegetate with native oaks should be undertaken.

Cal Trans Vegetation Improvements. Steps should be taken to promote woodland revegetation of the El Camino Real-Highway 85 intersection to visually and environmentally expand the wooded character of the park land.

Erosion Control. Such severe instability problems occur in the west bank that the Santa Clara Valley Water District has designated outright purchase for homes within the unstable zone as the most econmically viable form of erosion protection. In 1974 the District agreed to purchase 25 residential properties on Diericx Drive, Franklin Avenue, and Sleeper Avenue. So far the District has purchased 13 properties. It is recommended that this

program continue. Persons in the mobile home park are also located in an extremely unstable zone although they do not appear to be in imminent danger of bank failure. This portion should be monitored by the District and the bank maintained with rock lining on an "as required" basis.

Creek bed Enhancement. Toward the northern portion of the reach the stream has begun to cut meanders, once again widening the channel, creating rocky pools and gravel bars that lend themselves to the formation of an intersecting aquatic environment. This emerging pattern of oxbow meanders and pools should be enhanced and the new growth of young alders in the flood plain encouraged. Since the area of creek bank sliding is adjacent, the recommended earthwork will eliminate instability problems and allow for a desirable water-oriented landscape with enhanced recreation potential.

Reach 4: El Camino Real to Highway 85: The Neighborhood Parklet Link

This Reach is envisioned as a link between the large nodal community open space areas of Reaches 3 and 5 and a means to provide a series of passive open space parklet spaces serving the immediate neighborhoods and schools adjoining the creek. Although the creek trail has been routed around the initial segment of this reach from El Camino Real to Grant Road it is proposed to rejoin the creek and continue northward to form a continuous trail to the Bay.

Urban Setting

This reach stretches for 6,200 feet through an area of highly fragmented land uses in the City of Mountain View. Running from El Camino Real to the Highway 85 overcrossing, the Reach is spliced into four fairly equal segments by Grant Road, Dana Road, and the Central Expressway overcrossings. The Central Expressway corridor includes Evelyn Road and the Southern Pacific Railroad and has the greatest impact on the linear continuity of the reach. Since the creek lies to the west of the Expressway, the latter acts as a barrier to the multi-family residential neighborhoods to the east.

Each segment of this reach tends to have a somewhat different land use character. The initial segment from El Camino Real to Grant Road is fronted on the east by a mixed pattern of commercial and industrial uses which have a blighting influence on the natural character of the creek. On the other hand, to the west between the creek and Highway 85, the Monterey Whaling Station Restaurant and Winery occupy a well-vegetated site overlooking the stream. Grant Road to Dana Street is represented by a single family residential neighborhood with apartments sited on the creek bank and Landels Elementary School adjoining the creek to the west. This segment as well as the apartment uses adjacent to the creek from Dana to Central Expressway enjoy one of the finest stretches of mature riparian woodland found anywhere along the creek. A single family residential neighborhood abuts the west creek bank of the segment from Central Expressway to Route 85.

Just two schools are close to this reach: Slater Elementary at one-third mile to the East and Landels School adjoining the creek on the west. However, eight other schools flank this Reach at distances of one to two miles. To the east, Carson Elementary and Benner Intermediate are a little over two miles distant. On the west, Grand High School, Mountain View High School, St. Joseph's Mountain View Academy, and Casper Elementary are a mile to one-half mile, while Almond Elementary is two miles west.

The Creek Environment

Geology. Channel conditions are characterized by a fairly straight channel with gentle, open curves. At the southerly limit of the reach just north of El Camino Real, the channel is deep, about 36 feet with vertical banks. North of this section the channel gradually changes from 30 feet in depth to less than 20 feet around Central Avenue. Stream banks are generally moderately sloping with some areas much deeper; heavy ground cover covers most banks. Soils adjacent to the creek are the same gravelly loam and clay loam

encountered in upstream reaches. Groundwater is found at a depth of approximately 47 feet.

Erosion and Bank Stability. Much of this reach is considered moderately stable, however, four bank segments along the western flank are considered unstable and seven segments along the east bank. The least stable portions are found just north of El Camino Real where the steep, deep sides of the creek bank show much evidence of erosion and sloughing along the top of the bank. The next unstable area of note occurs at the Dana Street overpass along and across from the Landels School frontage. The soil under the Dana Avenue bridge footing is slowly eroding away. Scattered small slides occur along the reach up to an area just north of the Central Expressway where the last major unstable area is encountered involving banks on both sides. Power transmission poles appear to be the only structures threatened by the unstable slope areas, seven of which are located within the Geologic Hazard Setback Line and five in areas associated with unstable slopes. Although the apartments south of Landels School are located on the creek bank and within the Geologic Hazard Setback Line, channel conditions appear to be moderately stable.

Flooding. Between El Camino Real and Dana Avenue, stream channel depth and capacity is adequate to carry the one percent flood flow. However, between Dana Avenue and Central Avenue, flood waters would spill over the west bank and into the urban area due to the reduced depth of the stream channel and the backwater effect of flow restrictions created by the railroad track, Central Expressway, and West Evelyn bridges. It is estimated that 125 acres of residential and 170 acres of industrial and commercial land between Dana Avenue and Central Expressway would be flooded in the event of a 100 year flood.

Vegetation. The narrow band of open space within this reach is dominated (especially from Grant Road northward) by mature and lush riparian woodland. The woodland appears to be a District sub-unit, dominated in this case by a rather healthy, mature growth of native cottonwood trees. Subordinate species appear to include black walnut, Big Leaf Maple, alder, some oaks, willows and sycamores. Although some of the large cottonwoods are threatened with stream undercutting, with an occasional toppled tree, young cottonwoods seem to be plentiful either through root sprouting or regeneration. Non-native trees include several eucalyptus, some black acacia. Common shrubs are elderberry, coyote brush and bank stretches heavy with blackberry and poison oak.

Wildlife. Because of the encroaching urban uses, the wildlife value of this reach may be reduced. However, the high biomass of grasses, shrubs, weedy plants and trees is expected to produce an abundance of animal food. Blackbirds, finches, goldfinches, the brown towhee, several species of sparrows, the Audubon and Wilson's Warbler, mockingbird, robin, the Ruby-Crowned Kinglet, and Cedar Waxwing, starlings, jays, crows, and other species common to the upstream riparian woodlands of the creek. Bay-related species such as the Great Blue Heron, Green Heron, Black-Crowned Night Heron, mallard and wood duck are less common but present. The Long-Eared Owl appears to be present although uncommon in most other reaches. Numerous amphibians, reptiles, and mammals present in other reaches are also found. Uniquely, the bull frog and leopard frog only appear to be present within this reach and Reach 5. The Beechy Ground Squirrel is relatively abundant within Reaches 3, 4, and 5 as is the pocket gopher. Reach 4 also appears to represent the northerly range of the raccoon and the southerly limit of the Long-Tailed Weasel.

The Proposed Program

The following program recommendations are made:

Parklet Program

Monterey Whaling Station Restuarant and Winery Parklet. Private interest should be encouraged to enhance the lands adjoining the restuarant and winery complex by planting additional riparian woodland and orienting outdoor facilities to the creek with picnic tables and rest facilities for winery visitors.

Landel School Parklet. Available automobile access and parking at the school contributes to the opportunity for expanded neighborhood recreational and openspace uses in an area deficient in park space. A staging point for trail users and outdoor community activities are appropriate. Consideration of an exercise source facility, picnic facilities, and the like should be given in time. A detailed nature study program should be developed which may also be expanded on a cooperative basis to serve the other schools within the area. A footbridge from the school grounds to the east side of the creek would provide access to more of the riparian woodland area.

The Dana Street to Central Expressway Parklet. This existing parklet represents excellent neighborhood utilization of streamside lands. The landscaped park includes tennis courts, open play area, and sitting spaces under the PG&E power lines. The low earth berm recommended to contain potential flooding in this zone should be carefully routed between the tennis courts and the woodland, should include additional native landscaping, and incorporate the bicycle trail within its design in a manner which enhances the existing parklet.

North Central Expressway Parklet. The sizable parcel at the north of the reach is flanked on the west by a newer single family residential

neighborhood with little consideration of the potential neighborhood recreational amenity offered by the creek. The area is actively used by motorcyclists as evidenced by much bare ground. Although the topographic variation, mature trees, and land area invite ideas for developed recreational proposals, no particular use is proposed at this time due to distance from other centers of activity. It is recommended, however, that the area be protected from damaging uses, especially motorcycle abuse, and be conserved to serve as a future neighborhood recreation resource. Access should be controlled to allow pedestrian and bicycle access only.

Woodland Conservation. In the southern portion, where major erosion control structures are recommended, landscaping of native woodland should be incorporated into the design to reestablish the wooded character. Conservation measures include maintenance rock riprap where bank sliding undermines existing trees and control of motorcycle use. The intersection of Grant Road and Highway 85 off-ramp islands should be planted in native woodland vegetation to expand the visual and environmental breadth of the riparian corridor. Where possible, except as controlled by overhead transmission lines, riparian woodland vegetation should be planted in the Landels School grounds to enhance the natural wooded character of the school edge.

Creekside Trail Connection. In order to avoid a mid-block crossing at El Camino Real as well as land use encroachments within the segment from El Camino Real to Grant Road, it is proposed that the creekside trail be routed westward along El Camino to the intersection crossing at Grant Road, thence proceeding northward to rejoin the creek either at an entry point utilizing Cal Trans right of way at the Grant Road-Highway 85 intersection or from McCarty Road at the creekside apartments adjacent to Landels

School. The trail should proceed northward on the west bank, under the Dana Street bridge, and along the new earth berm proposed adjacent to the tennis court area.

The Central Expressway represents one of the most difficult crossing barriers within the creek corridor. It is recommended that just prior to the Southern Pacific Railroad Bridge, the creek trail be routed down a new stairway to replace one of the many footpaths in that area. An elevated rock walkway could be accommodated along the western edge of the stream channel to permit passage during periods of even moderate stream flow. Continuation of the trail would be possible as incorporated within the structures of the crossing bridges in this area.

Flood Control. Potential flooding south of Central Expressway would be alleviated by: installation of bypass pipes within the east bank from upstream of Evelyn Avenue to downstream of Central Expressway; creation of a landscaped earth berm along approximately 800 feet of the west bank upstream of Evelyn Avenue; and widening of the levees north of Central Expressway on the west bank to 15 feet along their upper width.

Erosion Control. A variety of erosion control and protection measures are recommended, the largest of which would control the progressive erosion of the west bank north of El Camino Real by use of large rock or possibly gabions. Other rock and sacked concrete lining measures are proposed at various points along the creek in a manner which minimizes the impact on existing vegetation. To promote upstream fish migration, a fish ladder at the SPRR bridge drop structure is proposed along with notches cut in two other low drop structures at Central Expressway. In addition, a 24-inch weir v-notch, downstream of the drop structure at Highway 85, is also proposed to

facilitate fish migration. Set back lines will prevent future development in unstable areas.

Reach 5: Highway 85 to Bayshore Freeway: Whisman Neighborhood Recreation Parkland

Objectives of Reach 5 recommendations are intended to: meet the great need for additional passive and active recreational space of the dense residential neighborhoods flanking the reach; facilitate use of the area for outdoor educational purposes; reduce the visual and noise impacts of the freeway on the open space; and enhance the role of the reach as a visual gateway for freeway travelers approaching the upstream scenic amenities of Stevens Creek.

Thus the program emphasizes active residential development, using Whisman School as a staging area. Substantial reforestation is recommended to serve the community use program as well as to visually strengthen the vegetated appearance of the creek.

The Urban Setting

This 4,700 foot reach is shorter, comprised of less public land area, has more limited inherent resouces, and yet is situated in a portion of Mountain View which has the greatest need for additional park and open space.

The reach runs parallel and to the east of Highway 85 from the point at which it undercrosses the expressway just south of Middlefield Road to a point at which it intersects Bayshore Freeway. Medium and high density residential is the predominant land use to the east, with a mixed pattern of high denisty residential and industrial immediately to the west. Whisman Elementary School, located on Easy Street, fronts the creek. Theuerkauf Elementary School is one mile west as is Adlai Stevenson School and St. Athanasius at one and one-half miles.

Although there is one small park to the west of the creek and freeway, the Whisman School grounds currently serve as the principal neighborhood park space for the eastside neighborhood. Although the city has recently adopted plans to provide picnic

space and new landscaping within the Whisman grounds, the area remains deficient in total amount of open space available to the population, excepting the recreational potential of the open lands along the creek.

To compound this deficiency, creekside lands are dominated by the visual and accoustical impacts of Highway 85, Bayshore Freeway, and the Middlefield Road-Moffett Boulevard crossing routes. Through the barrier effect of these roads, and the high traffic associated with them, access is only available from two locations, the Whisman School frontage on Easy Street north of Middlefield Road and a small publicly owned lot on Easy Street south of Middlefield Road.

The Creek Environment

Geology. Segments of this reach have been channelized with a concrete-lined channel. Although creek bank slopes are somewhat steep, from 1:1 to 1-1/2:1 in grade, they are of relatively shallow depth, tapering from approximately 20-feet-deep to about 20 feet toward the north. Surface soils consist mostly of Mocho clay loam which has moderate surface permeability. Silty sands, sands, and gravels which grade denser with depth, underlie surface soils. Groundwater is encountered at 60 feet.

Erosion. Most bank slopes are stable with some small slides and surficial slumps. Two areas on opposing banks in the southerly portion of the reach are considered moderately stable as is the portion of the bank fronting on the Whisman School grounds.

Flooding. Under existing conditions, flooding would not occur in Reach 5. However, if improvements are made to prevent overbanking near Central Expressway in Reach 4, the additional flows carried down the stream channel would spill over near the upstream side of the Moffett Boulevard culvert and near the drop structure upstream of Bayshore Freeway due to the backwater effects of these structures.

Vegetation. Although much of the original riparian ecosystem has been displaced by the concrete-lined channels and creek bank alterations, this reach represents the northerly limit of the riparian woodland and the transition between upstream ecological characteristics and those of the Baylands. Although some sizable cottonwoods are present throughout the Reach, the riparian woodland is characterized by the dominance of many species of willows growing on the banks of the creek bed. Many seedlings exist, evidence of the vigorous new growth occuring after previous alterations were completed. In most cases, the creek bank is heavily covered by blackberry and poison oak, making direct water access and exploration difficult. Fresh-water marshes appearing in the channel bottom enrich the ecological resources; cattails, nutweed and cyperius are the dominant species of this plant community. Non-native plant species as eucalyptus, have been planted in the southerly portion.

Wildlife. Reach 5 is considered the northerly habitat range for most of the amphibians, mammals, and birds typical of the upstream riparian ecosystem. Although some overlap occurs between upstream habitats and those associated with the Baylands, a decided shift appears between upstream and Bayshore wildlife. No species is considered an exclusive occupant of this reach; however, the bull frog, leopard frog, Western pond turtle, wood duck, Long-Eared Owl, Bank Swallow and House Wren are only considered present within Reaches 4 and 5 and such other species as the Whip-Poor-Will and Red-Tailed Hawk are considered present within Reaches 5 and 6. Species abundant or relatively common within the reach as opposed to the many uncommon but present, include the California Gull, Rock Dove, Mourning Dove, Anna's Hummingbird, Red-Shafted Flicker, Black Phoebe, Common Crow, American Robin, Ruby-Crowned Kinglet, starlings, warblers,

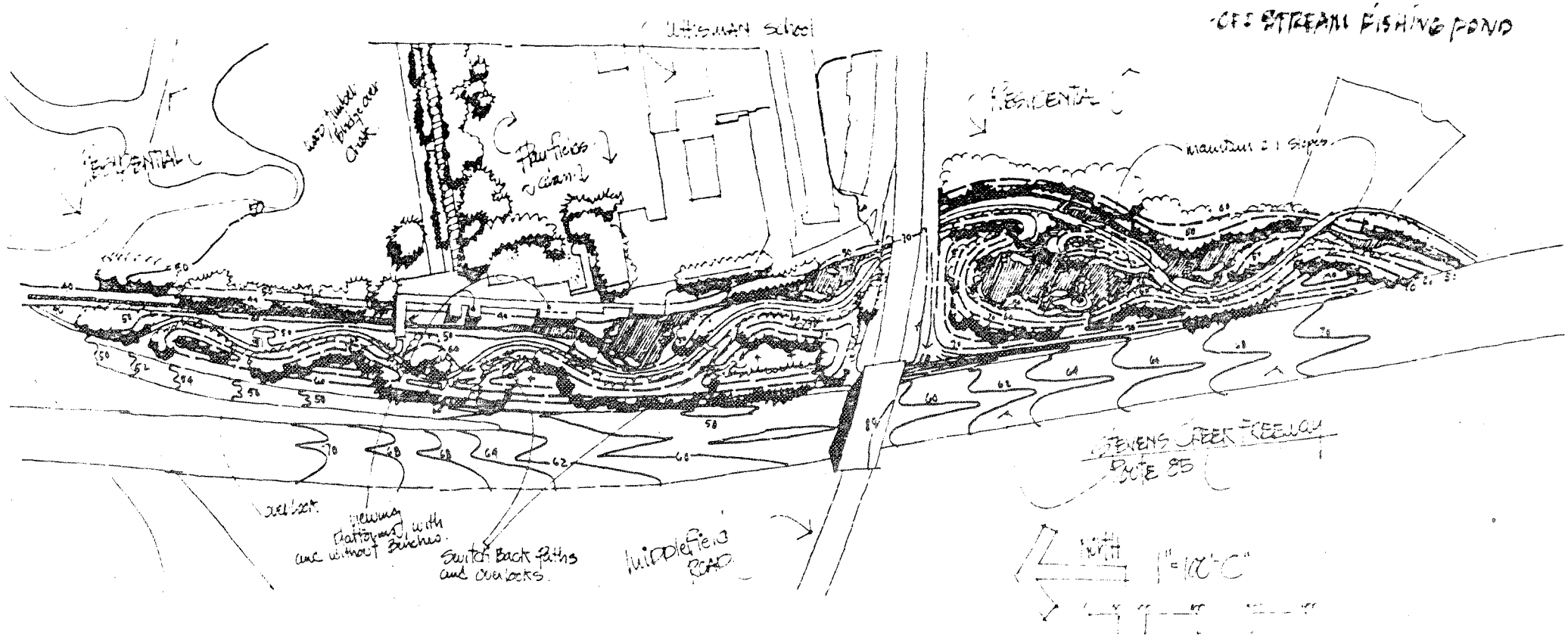
blackbirds, housefinch, ground squirrels, pocket gophers, western harvest mouse, and others, most of which are also believed to breed or nest within the reach.

The Proposed Program

Plan recommendations are set forth at two levels. Active community recreational uses are recommended to be clustered in the Whisman School area with landform alterations and reforestation recommended in the reach. A second increment of open space development is recommended for the lands south of Middlefield Parkway in which heavy land recontouring and reforestation are recommended. Program elements include the following:

Neighborhood Recreational Use. Whisman School should serve as a focus of community recreation activities to facilitate ease and efficiency of maintenance management. Its present character as a neighborhood parklet (including planned picnic sites) should be broadened into a full-scale neighborhood recreation facility which includes active use of the west side portion of the creek bank and intensification of the natural elements along the school creek frontage. Parking and washroom facilities support staging for an exercise course and measured jogging routes within the open lands, as well as bicycle and hiking trail use.

Creekside Trail and Access. The Creekside Trail, continuing from Reach 4, under the Route 85 overpass on the west side of the creek, should be continued in a meandering pattern along the westside to Bayshore Freeway. Middlefield Parkway and Moffett Boulevard overpasses are sufficient to permit passage of the trail, however, the creek underpass of Bayshore Freeway appears to constrain year-round trail use warranting construction of an overpass over Bayshore Freeway (see Reach 6 discussion). A footbridge should be provided at Whisman School to allow access to the west bank and



REACH 5: WISHMAN NEIGHBORHOOD RECREATION PARKLAND, EXPANDED PARK DEVELOPMENT SKETCH

allow access to the west bank and also in the vicinity of the parklet at the south of the reach to permit neighborhood access from that point. Both footbridges could be constructed in conjunction with existing flood control drop structures.

Landform Recontouring and Woodland Restoration. Moderate earthwork recontouring is proposed within the vicinity of Whisman School to mold the terrain to provide topographic variety and more direct access to the creek bed. Together with reforestation, this would provide a more water-oriented landscape and allow for a variety of differing spaces for outdoor classroom use and natural area exploration. As part of this program, it is envisioned that excavated materials would be used to provide a continuous berm along the edge of the freeway to offer acoustical protection for the area and to enhance its natural qualities. Construction of the trail could be incorporated into this landscape future.

Off-Stream Fishing Pond Option. South of Middlefield Road, the large tract between the creek and the freeway is recommended for consideration an off-stream fishing pond to be topographically incorporated into the landscape. Because the banks are low, a modest amount of earthwork would allow stream diversion of high water flows into the impoundment to maintain water levels on a yearly basis. With the creek dry in summer months, the off-stream pond would permit year-round, water-related neighborhood recreation. Walk-in access from bridges at Whisman as well as the Easy Street parklet would be convenient. A fish stocking program would likely be necessary, depending on the level of future fishing activity and success of young anglers. However, a pond of sufficient size and depth could be developed to sustain a permanent fish community.

Cal Trans Landscaping Along the Bayshore Freeway Interchange. The undercrossing of Stevens Creek at the Bayshore Freeway occurs at the confluence of interchanges for Highway 85 and Moffett Boulevard with the Bayshore Freeway. These extended public open lands form a significant visual node signaling the visual gateway to upstream woodlands. Since the woodland image of the creek and planting of the intersections are relatively weak in this area, it is recommended that landscaping be intensified and follow a native woodland vegetative theme in order to broaden the visual impact of the creek corridor.

Flood Control and Erosion Protection. Improvements needed to provide adequate flood protection include the construction of a two-foot-high weir downstream of the existing drop structure in this reach and minor grading of the east bank to provide adequate channel capacity. The major requirement is construction of a 12-foot diameter, 200-foot-long bypass pipe, or equivalent, near the Moffett Boulevard drop structure to enable high velocity flood flows to bypass the restriction. A fish ladder would be provided at the existing drop structure to permit upstream migration. No erosion protection measures are required. Set-back lines in this reach may control future land development in some areas.

Reach 6: Bayshore Freeway to Crittenden Lane: The Levee Corridor Link

This reach is viewed as a simple corridor linking the upstream open space lands and use areas to the Bayshore reach and Shoreline Park. Although some public lands border the reach, it is desirable to cluster public use activities in the Bayshore portion rather than maintain a system of scattered sites along the creek course.

It is recommended, therefore, that this reach be utilized simply as a trailway to serve the continuous creekside trail to the bayshore, serve bicycle commuters to future employment centers in the baylands, and to provide walking access to Whisman

Elementary School by youths residing in the Moffett Field Apartments. Proposed improvement of the levees for flood control purposes should incorporate the trail facility along with a modest program of native landscaping to enhance the visual and habitat aspects of the corridor. Also essential, future development adjacent to the creek should promote a positive orientation and encourage recreational use.

The Urban Setting

Extending from Bayshore Freeway to Crittenden Lane, the reach is characterized by a straight, dredged channel with high levees on both sides and is the least distinguished of the reaches. A mixed pattern of vast open lands, industrial and residential land uses flank the outer levee boundaries. The entire eastern levee abuts Federal lands within which the NASA/AMES Research Center and Moffett Field Naval Air Station are located. Apartments housing Navy personnel encroach on the edge of the east levee. Just north of these apartments is the approximate site of the proposed NASA Space Museum which would be entranced by the Charleston Road extension; the extension would cross the creek to the north and serve as a secondary access to the Federal complex. On the west, a small parcel of public land lies between the creek and the Bayshore Freeway. The gravel works to the north is followed by a mobile home park and two agricultural parcels planned for industrial development. Five PG&E transmission lines converge in this reach forming a visually dominant transmission pole corridor paralleling the creek. A Christmas tree farm utilizes the land under the power lines.

Crittenden Elementary School, one mile to the west, and Monte Loma Elementary. one and three-quarter miles to the west, are the only schools in this Bayland area. There are no other public facilities.

The North Bayshore Plan of the City of Mountain View, which has jurisdiction throughout the reach, provides for future industrial development of the vacant lands to the west.

A current development proposal, Shoreline Business Park, located on the vacant lands between the mobile home park and Crittenden Lane adjacent to the creek, is designed to provide for the development of a quality, low intensity industrial park, consisting of a range of modern, large-scale research, adminstrative, manufacturing, wholesale and storage uses. Development is intended to be complimentary to the adjacent open space and parklands through provisions for on-site open space and landscaping. A limited amount of commercial development will serve the immediate area and patrons of Shoreline Park. The proposed Charleston Road extension bisects the intended development in an alignment which crosses the creek toward the southern portion of the Christmas tree farm.

Individual enterprises will be developed incrementally according to the design guidelines of the precise plan. However, a uniform concept of site landscaping including earth-form mounding and mixture of large trees is sought, along with provisions for common pathways through the Business Park. A large retention basin will be excavated running east/west and toward the center of the project, forming a common open space area.

Although separated somewhat by the power line corridor and Christmas tree farm, Shoreline Business Park and the Stevens Creek planning area share several potential linkages, including: trail tie-in between the Business Park and the creek along the Charleston Road Extension; common native vegetational themes; habitat trade-offs between the creek and the retention pond open space facility; and commercial activity support for the planned recreational integration of Shoreline Park and Stevens Creek.

The Creek Environment

Geologic and Erosion Conditions. The straight, levee-flanked channel is narrower toward the south and gradually broadens northward toward the Bay. Soils consist of Mocho clay loam and sandy loam; sub-surface borings show the area to be underlined by soft to stiff silty and sandy clays with

small amounts of gravel. Groundwater is encountered between six and ten feet. Channel sides are considered stable with one small area of moderate stability adjacent to the Moffett Field housing where the bank has been undercut and several small slumps have occurred. Levees north of the trailer park are in good condition with minor cracking.

Flooding. The potential for flooding now exists on both the east and west sides of the creek. On the west, a mobile home park and many commerical structures would be flooded. On the east, facilities of NASA-Ames Research Center and of the Navy would be flooded.

Vegetation. This reach represents the upland limit of the tidal saltwater influence and is thus ecologically significant due to the overlap of fresh and salt waters. Plant growth is not well established on the levees, consisting of low woody plants such as willows, coyote brush, and blackberry where vegetation occurs, yet the creek bed supports an abundant growth of fresh and brackish water marsh vegetation. However, periodic channel clearing to ease sedimentation problems prevents more than the sparse development of freshwater marsh community. From a habitat standpoint, the vegetation value of this reach must be viewed in conjunction with the surrounding weedy lands and agricultural fields.

Wildlife. The great amount of open fields flanking the reach, which provide excellent cover for birds, coupled with the water available at the creek, promotes substantially higher bird populations than any other reach except the Bayshore. Here, hundreds of finches and Audubon's Warblers spend September to April, having migrated from their breeding grounds in Canada and Alaska. White-Tailed Kites, marsh hawks, Short-Eared Owls, American Kestrels, and Loggerhead Shrikes hunt the adjacent fields and the creek channel for rodents, smaller birds, and large insects. The marsh vegetation

provides nesting grounds for several species, including Song Sparrows in a transition zone of upland species and threatened salt marsh species. It is possible that the salt marsh Yellowthroat, now being considered for endangered species status, nests in Reach 6. Only the more common upstream amphibians, such as the California Slender Salamander, Western Fence Lizard, gopher snake and garter snake appear to extend their range into Reach 6. Few upstream mammals are present, except the Beechy Ground Squirrel, Botta pocket gopher, and the long-tailed weasel. Three types of shrews, the vagrant shrew, ornate shrew, and trowbridge appear to breed in Reach 6 exclusively. The Salt Marsh Harvest Mouse may be present as may the California Meadow Mouse, while the Black-Tailed Hare appears to be present in only this and Reach 5.

The Proposed Program

Although the plan proposed for this reach consists simply of integrated trail and flood control uses, several program elements need to be undertaken. These include the following:

Trail Use and Access. The trail facility proposed along the west levee top, will serve several trial uses. As a link between the upstream creekside trail and the Bayshore, it will facilitate weekend day-trip recreational use. By connecting future Bayland industrial lands and employment centers with the upland urban community it will provide an increasingly popular alternate mode for commuting to work by bike trail. Provisions of bridges from the westside trail to Whisman School and a bridge and a trail connecting to the Moffett Field apartments, will enable school children convenient access to Whisman School. Where access points are provided adjacent eastside employment centers, recreational strolling or jogging would be permitted for employees during their noontime break.

A single trail should be located on the west side only to avoid facility duplication, unnecessary maintenance and security surveillance requirements by the Federal installations. Due to the rigid adjacent structural and land use encroachments, no variation in the configuration of the channel route is proposed. Access across the creek from Navy lands to the trail would be provided by a footbridge in the vicinity of Vernon Avenue serving schoolchildren as well as the secondary commute bike route for employees of the Federal complex. A restrictive gating device would prevent access by motorized vehicles. The Navy has volunteered to construct the bridge as a community work project.

To permit safe year-round access, a pedestrian overpass over Highway 101 would be required which is conceived as being incorporated within existing overpass support structures.

Charleston Road Extension. The bridge facility required to extend Charleston Road across Stevens Creek should accommodate the creek trail without disruption and provide for convenient tie-in for bicycle and pedestrian trails along Charleston Road. Access for maintenance vehicles should also be included along with suitable landscaping to enhance the natural appearance of the creek.

Crittenden Bridge Replacement. The need to raise and modify the levees for flood control purposes will require raising, but possibly removal of the existing Crittenden Lane Bridge structure. To replace the bridge at this point for access of maintenance vehicles would unnecessarily duplicate the proposed new Charleston Road bridge facility; it is not recommended that recreational access be provided at this point. It is proposed that the present Crittenden Bridge not be rebuilt in favor of a new recreational bridge crossing located downstream in Reach 7, should the proposed new Charleston Road Bridge be constructed.

Flood and Erosion Protection. Although the channel in this reach is confined by levees, they are not high enough to prevent potential flooding. The levees would be raised to contain the one percent flood at heights that would increase toward the Bayshore. At the Moffett Field apartments, a floodwall will be constructed to protect the apartments because the encroachment of the buildings prevents continuation of the raised levee. A gentle slope along the side walls of the levee may be provided to permit recreational exploration of the creek channel.

Six transmission towers will need to be raised to provide minimum clearance of the levee top. Because the right of way presently owned by the District is inadequate for the proposed improvements, additional land must be acquired from Kaiser Industries, the City of Mountain View, PG&E, and the U. S. Navy.

Channel Maintenance. Although little channel maintenance is envisioned once the levees have been reconstructed, the removal of sediment build-up to maintain water flow can have substantial impact on marsh vegetation in the stream channel. Where necessary, bulldozing of channel sediments should be restricted to limited segments of the channel during the September/October period on a rotational basis over several years to reduce impacts to avifauna breeding and feeding in the channel marshlands.

Landscaping. Augmentation of existing stands of trees and introduction of tree plantations is proposed to provide screening, visual relief, and improve the overall attractiveness of this portion of the creek. Cottonwoods and willows should be the emphasized tree form. Within off-creek developments, especially the Shoreline Business Park, landscaping programs should emphasize native plant materials with substantial use of cottonwood or willow trees.

Reach 7: Crittenden Lane to Bay: The Bayfront Parkland

Plan opportunities within Reach 7 offer exceptional potential public benefits. Their achievement may foster the great public debate. At issue is the lack of direct Bayshore public access for southbay communities; the relationship between flood protection, environmental enhancement, and public recreational benefits where parklands and salt ponds flank creek levees; unnecessary duplication of levee facilities; the incorporation of the new marshland preserve being acquired by the Midpeninsula Regional Open Space District into the Shoreline Park System; and the management relationships between public recreation activities and sensitive habitat conservation.

The opportunities include making Shoreline Park into a truly water-oriented "shoreline" parkland facility; significantly adding to the total amount of marshland within the county through an "in-channel" restoration program; and providing for meaningful, environmentally compatible, water-oriented recreational opportunities serving a wide range of public areas.

These opportunities were made pressing by two supporting considerations:

1. When Shoreline Park was originally planned in 1968, it was anticipated that the Stevens Creek Expressway would be extended from Bayshore Freeway northward to the proposed Bayfront Freeway which would effectively create a wall between Shoreline Park and Stevens Creek and preclude possible shoreline use of the Bay. The role of Stevens Creek as a water feature within the plan and as an access route to the bay waters was thus ignored. Since that time the freeway proposals have been abandoned, yet the development of Shoreline Park continues under these assumptions.

2. The potential for freshwater flooding caused by the one percent flood creates the opportunity to consider the integration of flood protection measures into the Shoreline Park design as a means of increasing environmental and recreation benefits. Any flood protection which is extended northward through the salt evaporation ponds should also consider the advantages of increasing environmental and recreational benefits within the channel and levee flood protection design.

Taken together, these issues, plan opportunities, and supporting considerations offer significant planning choices which warrant rethinking of the Shoreline Park Plan and thoughtful public review of public benefits and policy tradeoffs where extension of flood protection to the bay waters is considered.

The Urban Setting

Reach 7 extends 8,400 feet from Crittenden Lane to San Francisco Bay through a mix of Bayshore open lands. Half of the reach from Crittenden Lane to the inboard salt pond dike lies within the City of Mountain View; the remainder is within Santa Clara County jurisdiction. Shoreline Park, the salt evaporation ponds, and Moffett Field are the dominant open land uses. The regional waste disposal project which is gradually transforming the 544 acre Shoreline Park site into a major regional parkland facility serves as the nucleus for bayfront recreational use. The salt ponds of the Leslie Salt Company to the north provide an interlude of quiet water separating Shoreline Park from the Bayshore.

The salt ponds contain waters in the first year of the five year salt concentration cycle which carries Bay waters through the pond system to the East Bay where salt is harvested. Duck hunting clubs lease the lands for hunting purposes. Across the creek, east of Shoreline Park is a 54 acre salt marsh to be purchased from Leslie Salt Company by the Midpeninsula Regional Open Space District with a Land and Water Conservation Fund grant. A small farm and riding stable is located on the lowlying lands just north of Crittendent Lane.

Stierlin Road is the primary access road, a north-oriented arterial that provides public access to Shoreline Park. Future development of the Space Museum and Park in the NASA complex will complement the Shoreline Park facility and increase the level of regional use. Although the original Shoreline Park plan proposed a more urban park concept with intensive use areas, the present park philosophy emphasizes the natural area and associated outdoor uses. What is retained in the park concept is the original

inward-looking plan rather than one directed toward the bayfront and streamway waterscapes. The original plan proposed an internal water orientation provided by a small boat lake with a power and sailboat linkage to the bay via a deep water channel. While the marina and intensive developments have been deleted, smaller irrigated lakes have been retained in the golf course. Redirection of the plan toward capitalizing on the water features at the edge of the park should be considered. At present, the plan does include restoration of a ten acre marshland between the eastern slopes of the earth fill and the Stevens Creek levee. A geometric, trapezoidal shape determined by alignment of the PG&E powerlines and the inboard levee is being followed. Pipes are proposed to breach the Stevens Creek levees to allow fresh and salt waters into the marshland restoration area.

The Creek Bayfront Environment

Channel Conditions. The channel follows generally a straight, unrelieved configuration which angles near the Bayshore toward the northeast. It was originally dredged in 1967 and bay mud used to form the levees which line its entire length. As a result of the consolidation of bay mud combined with regional land subsidence, the levees gradually sank and in 1975 were raised to approximately ten feet with imported fill. Soils in the vicinity of Crittenden Lane are primarily Alviso clay which is saline or alkali soil with poor drainage.

In general, the levees appear in good and stable condition although a few areas show tension cracks and bulges in the slopes, possibly caused by settlement as a result of the additional fill placed in 1975.

Fresh Water Flooding and Tidal Conditions. Flooding from the one percent flood can be expected in the restored tidal marshlands of Shoreline Park west of the levee as well as northward through the salt ponds to the Bay. Overbanking of flows into the restored marshlands would do little damage;

however, fresh water flooding of the salt ponds would dilute the salt pond water and disrupt the salt harvest cycle. This same area would also be subject to salt water flooding under extreme storm and tidal conditions. All of Reach 7 and a portion of Reach 6 is subject to tidal salt water influence. The tides, which rise and fall twice a day, have a mean tidal variation of approximately seven feet; mean sea level is about four and one-half feet. The tidal range between extreme low tide which is only two and one-half feet below sea level, and extreme high tide which is about 11 feet above sea level is over 13 feet.

Because of the long, flat profile of the Baylands channel and the low velocities of stream flow, sediment buildup has occurred since the last channel dredging. Although future sediment deposition will depend somewhat on changes in the rate and amount of upstream stream erosion, it is likely that the level of sediment buildup is approaching a point of stabilization in which the added streamborne sediments are equal to the amount withdrawn from the channel by stream flushing during high winter flows and daily tidal fluctuation.

Vegetation. Replacement of the Bayland marshes by salt evaporation ponds, and channelization of the creek as a flood flow facility, has vastly altered the vegetation historically associated with the Bayfront portions of the creek. A limited amount of remaining marshland is found along the Bayshore margin at the mouth of the creek. Salt marsh has recolonized a portion of the straight channel, although stream flow scouring of sediment deposits and plant materials impede more extensive marsh development. The dominant species within the marshland are cord grass, pickle weed, and salt grass. Although meager, these remnant marshlands add measurably to the limited amount of saltwater marshland remaining in the baylands of the county.

Wildlife. The diversity of habitat conditions found along the bayshore tidal and channel marshlands off-shore mudflats and baywaters, and flanking evaporation ponds offers habitat for the most diverse bird populations found within the planning area. The cord grass (Spartina) marsh along the creek channel and the bayshore provides excellent cover and food for the endangered clapper rail, the Virginia rail, the threatened Alameda salt marsh song sparrow, the threatened salt marsh yellow throat, the Savannah sparrow, and the water pipit all or some of which may reside here. The mudflats within the channel and at the mouth of the creek which are exposed by tidal action, provide rich foraging for thousands of migrating and wintering shorebirds which visit the Bay.

The salt evaporation ponds introduce special habitat conditions into the bayshore fabric. These shallow waters, of reasonably low salinity, contain small islands and a network of electric transmission lines and towers with wooden platforms and walkways. Being non-tidal, the area provides reliable foraging, loafing and resting areas for thousands of birds of many species: shorebirds, ducks, heron, egrets, pelicans, gulls, terns, grebes, and a few predators including marsh hawks and short-eared owls. These areas are used at all times, but especially at high tide.

The numerous dikes and islands created by various flood channels and salt evaporation ponds have in themselves created niches for additional wildlife species which in the past 75 years have established themselves as part of the breeding avifauna of San Francisco Bay. The dikes and islands provide stable ground above high tide level which is usually free from predators. Species taking advantage of these dikes in the vicinity of Stevens Creek include Foster's Tern (hundreds nest off on salt pond islets south of the creek), avocets, black-necked stilts, and snowy plovers. Many other

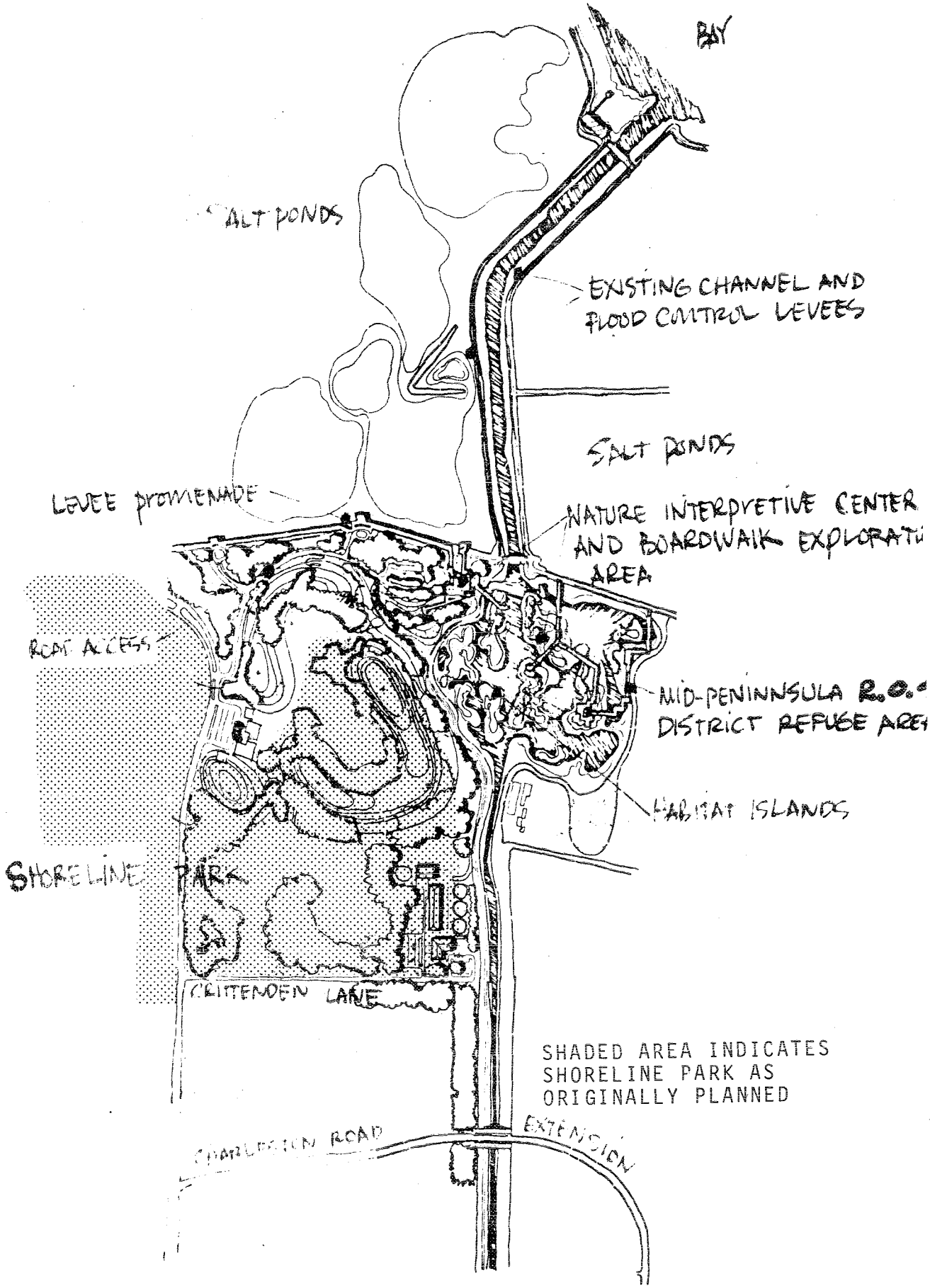
Stevens Creek include the Caspian tern, the endangered least tern, great blue heron, black-crowned night heron, snowy egret (from Bair Island off Redwood City to dikes near Alviso and Drawbridge). No doubt, controlled access of the dikes has enhanced the level of colonization.

Proposed Program

A basic plan together with options for future consideration is recommended for the Bayshore portion of Stevens Creek. The Basic Plan focuses primarily on the creek adjacent to Shoreline Park and is aimed at integrating Shoreline Park with the creek and the new marsh rfuge of the Midpeninsula Regional Open Space District within a uniform concept for flood protection, recreational use, and public access. The plan emphasizes an "in-channel" concept of increased environmental and recreation benefits which make the creek a water-oriented focus for the eastern portion of the park.

Although creek improvements from Shoreline Park to the Bay are not incorpoarted into the Basic Plan, a scheme for improving this segment by extending "in-channel" environmental and recreational benefits from Shoreline to the Bay is the subject of a Future Option. Within this framework of curvilinear levee and creek form, other options are discussed relating to increased public recreational use and access.

Basic Plan. In order to create a strong functional and physical relationship between the creek, Shoreline Park, and the marsh preserve of Midpeninsula Regional Open Space District, it is proposed that the linear dikes on the east and west side of the creek be branched to create a broad, common marshland restoration area within which the creek channel is permitted to meander under natural channel patterns as the marshland builds up. Once these low areas are subject to natural stream flow and tidal fluctuation, and being to accumulate marshland, reestablishment should occur naturally. Portions of the existing levees retained to create isolated islands provide resting and nesting areas for bird life; other islands within this marshland complex should also be formed.



REACH 1 THE BAYFRONT PARKLAND : THE BASIC PLAN

The eastern edge of the Shoreline Park landfill would serve adequately to contain the one percent flood. It is recommended, however, that modifications to the present park edge design be made to achieve a more parklike, natural looking form rather than the geometric shape followed at present. Although the height and shape of this landform is determined by the alignment and necesary clearances below the power lines, the configuration could be relieved to some degree by creating peninsulas which juts out into the marshland without impinging on needed clearances. These peninsulas could mitigate the steepness of the levee slopes and allow pedestrian access to the marsh edge as well as improve visual appearance. Although the full acreage assigned to the Shoreline Park Marshland Restoration Area is regulated by Corps of Engineers permits, it would be desirable to alter the design toward the north corner to improve the function and appearance of the parkland. The illustrated encroachment might be justified by the significant gains in marshland restoration throughout other portions of the channel.

Although breach of the east side levee allows incorporation of the Midpeninsula Regional Open Space District marsh refuge into the channel scheme, some flood containment to the east of the refuge may be necessary. Levees could be designed to maximize public use of the marsh refuge area.

In order to make full use of the proposed creek and marshland park focus, it is recommended that the road and parking facility planned along the southern border of the park be relocated to the northern boundary along the salt ponds. The planned Shoreline Park Interpretive Center should be located in the northeastern corner to allow maximum use of the creek and the marshland restoration areas. The Center can be used as a staging facility

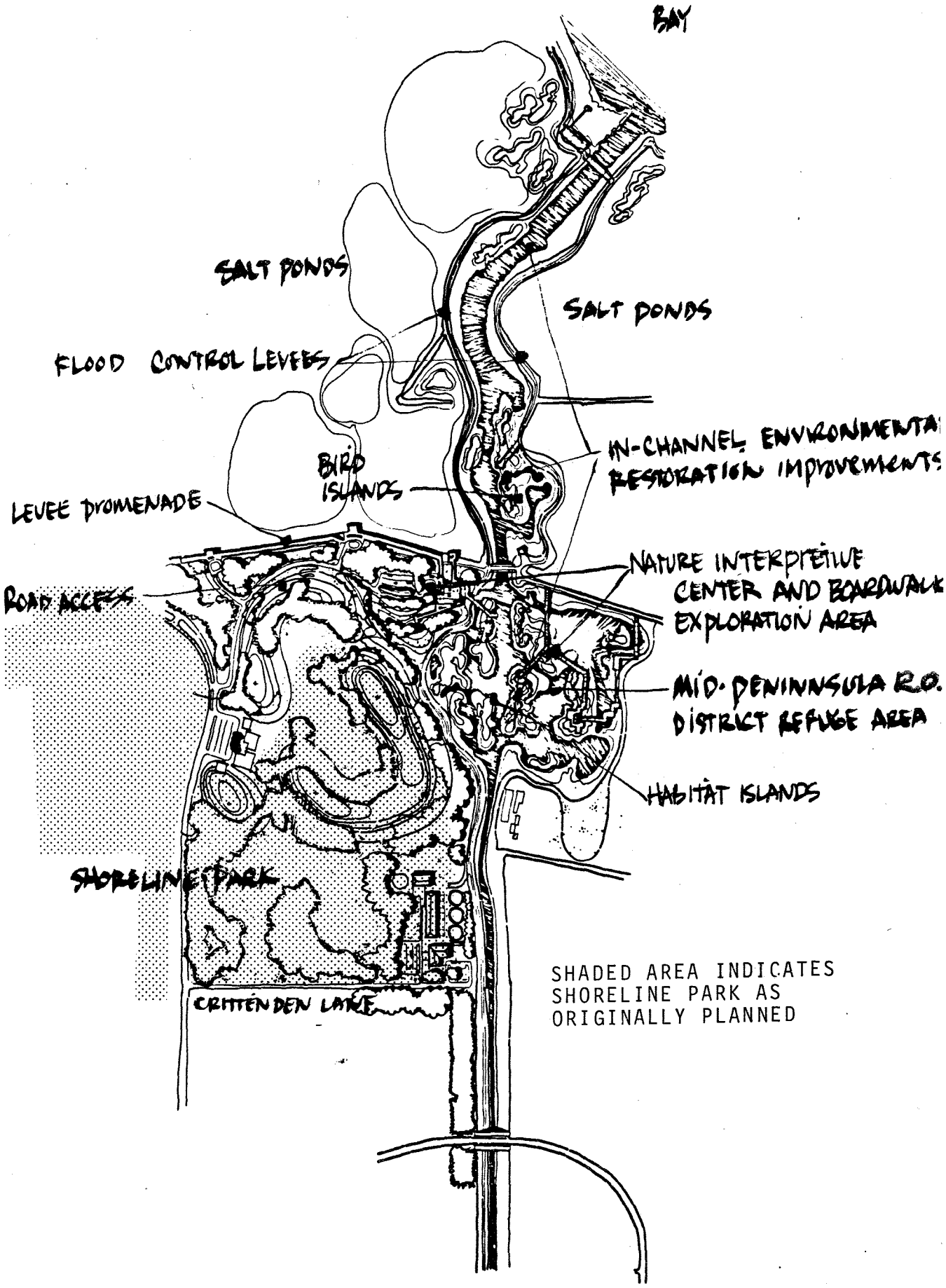
for visitors and offers logical public access to the new Midpeninsula Regional Open Space District refuge.

A new footbridge replacing the old Crittenden Lane bridge should be located at this point, the creek aligned with the in-board levee to provide eastward access and provide another link to the Baytrail. A system of boardwalks are illustrated which provide a loop interpretative trail through the marshland and bird island complex.

Under the basic plan, the existing creek levees north of the "in-channel" marshland scheme would be left as they are with no flood improvements to protect the salt ponds from the one percent flood. However, trial access would be permitted along the top of the levees northward to the baywaters. Access would be permitted to the mouth only and restricted from the outboard levee separating water from the salt pond.

Option Plan: Extension of Shoreline Park to the Bay. Under this scheme a widened, curvilinear channel configuration is proposed for the channel segment from Shoreline Park to the bay as an alternative to the narrow, straight-sided levee. The proposed design would not only enhance the appearance of the area and the recreational experience, but carry the concept of in-channel environmental and recreational features to the Bay waters.

Under this scheme, it is envisioned that a deeper channel would be formed on the western side of the creek which would be reserved for more active recreational and trail use. Widening the eastern portion would allow for mud-flat shoaling and marshland development within the creek. Although subject to tidal action, the relatively protected character of the proposed estuarine marshlands coupled with the opportunity to build additional protected bird islands within the channel would result in an



OPTION PLAN: EXTENSION OF SHORELINE PARK TO THE BAY

especially valuable new habitat complex. The new configuration would also provide a series of "holding" bays which would assist in the initial winter migration of anadromous fish to upstream spawning beds by permitting mixing of fresh and salt waters necessary to acclimate the fish.

Accomplishment of this option should be tied to future planning for fresh water flood protection of the Leslie Salt evaporation ponds. Approximately 15 to 25 acres of salt pond lands immediately adjacent to the creek would be required to achieve the recommended environmental program. In exchange, this would permit a levee cross-section of somewhat smaller dimension due to the increased amount of flood capacity within the channel and the level of protection from fresh water flooding desired by the Leslie Salt Company. Future consideration of this stream segment would be contingent on the salt water flooding and levee protection study to be undertaken by the Corps of Engineers.

As in the Basic Plan, trail use would be permitted along the tops of levees.

Other Future Plan Considerations. In the design of channel improvements intended to improve and extend Shoreline Park to the bay waters, several concepts maybe considered for increasing the intensity of recreational use. Each relates to the extremely limited access to bay waters afforded south bay communities as well as to the limited opportunities for salt water fishing.

Bayshore Recreational Fishing Opportunities. Fishing from piers on the bay shoreline can be a popular recreational activity; at the moment, such opportunity is rare in south bay. Should more intensive recreational use of the Stevens Creek extension to the bay be desired, small fishing platforms from the piers could be accommodated on the western side of the proposed

improved channel, particularly where sufficient water depth remains between tides. Should it prove desirable to increase these water depths, a series of temporary weirs could be established low enough to permit tidal flooding yet able to retain higher levels of bay water in the channel at low tide, thus trapping bottom fish and other bay species and enhancing the fishing resources within the channel. These weirs would be removed in the winter to permit normal stream flow flushing and scour of the channel. A fishing pier at the mouth of the creek, extending into bay waters might also be considered.

Public Access Opportunity. Although "point-type access" directly to the bay rather than peripheral access is envisioned in the preceding schemes, consistent with present Bay Conservation and Development Commission Policy, it may be necessary in the future to consider a more flexible public access program as demand for direct bay shore recreation increases. The great distance of the bay from Shoreline Park, and limited access by pedestrian, bicycle or equestrian means, may result in a relatively lower use level than in other parts of the bay area where automobile circulation permits direct access to shorefront points. Limited automobile access may be demanded in the future, and may be both physically and environmentally feasible if carefully handled.

ESTIMATED TOTAL PROJECT COSTS

(1980)

FLOOD/EROSION CONTROL

REACH	CONSTRUCTION	ENGINEERING & CONTINGENCIES	RIGHT OF WAY	SUB-TOTAL	TOTAL
1	$ 50,000	$ 17,500	$ 1,000	$ 68,500	
2	561,000	196,000	51,000	808,000	
3	0	0	0	0	
4	1,189,000	416,000	164,000	1,769,000	
5	204,000	71,500	0	275,500	
6	816,500	286,500	115,000	1,218,000	
7	454,000	154,500	55,000	663,500	
	$3,274,500	$1,142,000	$386,000	$4,802,500	$4,802,500

RECREATION/RESTORATION

REACH	EARTHWORK		LANDSCAPE		TRAIL IMPROVEMENTS		SUB-TOTAL	TOTAL
	Terracing	Earth Berms	Woodland Restoration	Riparian Restoration	Trails	Entry Gates		
1	$ 0	$ 0	$ 0	$ 4,000	$ 0	$ 0	$ 4,000	
2	0	9,000	39,000	15,000	0	0	63,000	
3	121,500	16,500	59,500	9,000	26,500	1,500	234,500	
4	0	5,000	35,500	22,000	28,000	5,000	95,500	
5	53,000	9,000	43,000	16,500	27,000	1,500	150,000	
6	0	0	0	86,000	35,000	0	121,000	
7	0	0	0	122,000	129,000	4,500	255,500	
	$174,500	$39,500	$177,000	$274,500	$245,500	$ 12,500	$923,500	$ 923,500

TOTAL PROJECT COST: $5,726,000

PLAN IMPLEMENTATION

PLAN IMPLEMENTATION

Plan objectives and project actions proposed in the preceding chapters will not be accomplished tomorrow. The natural resource objectives of the Stevens Creek Plan, by their nature, are both long-term and on-going. The wide range of projects and actions possible must necessarily be protracted over time to allow implementation within community and government capabilities. Community needs and open space use demands may also be expected to change and expand, requiring continuing plan refinement, perhaps involving greater recreational demands on open space resources.

Standard methods of plan implementation vary as to the time periods they serve, yet the trend in recent years has been toward short term rather than long term planning tools. City General Plans, for instance, traditionally viewed as long range plans for urban development over typically a 20-year period, today are considered only workable within a 10-year time horizon due to the pace of economic, social, governmental, and public attitudinal changes. Sub-area planning, especially utilizing newer legislative powers providing for specific plans, are now commonly employed to address pressing developmental and planning issues within a one to five year time frame. The great reliance today on the three to five year capital improvement program and the one year departmental program planning and budgeting process also represents the increasingly short-term focus of the plan implementation process.

How then should the Stevens Creek Plan be implemented? Although many of the proposed projects are anticipated within the short term, full enhancement and community utilization of the resources and opportunities of the Stevens Creek Corridor must necessarily be long-term. The fundamental challenge to the design of a workable implementation program is to meet this need of a long-term commitment despite the increasingly short-term approaches to current methods. The requirement is to provide for a continuing framework of plan objectives policies, options, public and private roles, procedures, and institutional agreements built around a unifying implementation strategy.

Implementation Issues and Recommended Strategy

The Basic Issues

Planning implementation involves several elements: administration of the plan and its objectives and policies; continuing initiation, financing, and development of specific projects; the origination of new projects determined through continuing planning; and program management of facilities and services through administrative, maintenance, and support activities. Several issues affect the carry-through of each of the elements.

The lack of a single entity with a clear over-all responsibility throughout these implementation functions is an essential weakness of the Stevens Creek Plan implementation process. The Corridor cuts across the jurisdictions of five general purpose governments, five school districts, two special districts, several State and sub-State agencies, several Federal entities with direct and indirect interests in the corridor, and includes the utility right of way of Pacific Gas and Electric Company. Each entity brings to the Corridor its individual concerns, planning approach, management capabilities, and institutional perspective. Many of the purposes of these agencies may inherently conflict; for instance, the desire for public recreational access to the baylands and for the development of local government recreational programs potentially conflicts with the need of the Department of the Navy to maintain an effective, strong security program within Navy boundaries.

Given the multi-use character of the proposed plan, with interrelated flood control, erosion reduction, open-space conservation and restoration, and recreational and educational program uses, it is difficult to identify the single, over-all lead agency responsibility from a functional standpoint. The Water District, with clear authority for providing needed flood and erosion control, assumes a defacto lead role because it can initiate implementation of creek facilities yet, although its enabling act would permit it, it is not mandated to assume added responsibilities for related recreational and open space improvements. City and county governmental departments share fragmented

responsibilities toward the creek: planning departments are concerned with land use and circulation aspects, particularly the need for open space as it relates to the County and Cities General Plans; Recreation and Public Works Departments must consider the corridor from the standpoint of their place in the overall City-wide program of Parks and Recreation facilities; Fire and Police Departments are faced with confusing gaps and overlaps in jurisdictional responsibility and response accessibility. The Midpeninsula Regional Open Space District stands out as a likely candidate for lead agency responsiblity along the creek, yet current policy confines the agency's activities to land acquisition in the Baylands and hillside areas and does not include general management responsibilities.

Consideration of institutional capability, i.e., organization, staffing, funding, etc., sufficient to the implementation task, is equally ambiguous in the determination of lead implementing agency responsibilities. The Proposition 13 ballot initiative limits both local and State governmental capabilities although local government is most directly affected due to its great reliance on property tax revenues. However, the recent shift of funding support for local programs through State sources can be expected to greatly limit funding available to State departments, and hence, limit the potential direct votes of State agencies in local project implementation. Yet even prior to the Jarvis-Gann initiative most agencies were hard-pressed to meet existing budgetary demands with pre-initiative revenues. Although State legislation required that new budgets be adopted by September 30, 1979 to reduce property tax revenues and provide revenue distribution arrangements, agency adjustments and budget revisions can be expected to continue in the next few years, clouding capabilities and the willingness of agencies to assume expanded responsibilities.

This recent, unparalleled fiscal dilemma of local government will undoubtedly impose a hiatus in the plan adoption and implementation process. The public can expect a transition period during which governmental services, public needs and governmental revenues are reassessed. Many of the funds normally used for capital improvement may need be diverted to support operation and maintenance activities. Where flood control

and erosion reduction projects are called for, these facilities may be required to be developed over a protracted schedule.

The heavy cut-backs in local general fund resources, the primary support of community services in the past, has already resulted in increased demands for State and Federal involvement. However, the recent shift of funding support for local programs through State sources can be expected to greatly limit funding available to State agencies and hence, limit the potential direct roles of State agencies in local project implementation. Although some Federal programs have substantially contributed to local community and special recreational planning programs in the past, most of these programs are directed toward acquisition and development costs, while management, operation, and maintenance financing is considered a local responsibility. As a result, utilization of the more commonly known Federal assistance programs may prove difficult without more flexible adjustments in Federal legislation or administrative guidelines.

Irrespective of present institutional capabilities and fiscal uncertainties, there remains a continuing problem of responding to the community needs of a diverse urban public within an existing and future interjurisdictional and interagency framework. The governmental entities within Santa Clara County have strong traditions of public participation in the community decision-making process. An active, local citizenry will require a role in the continuing plan implementation process. Yet it is far easier to engage community groups to participate in the development of the plan when overall plans are being made and when the time frame is concentrated. Formal involvement of citizen groups and advisory councils in planning programs works best within the practical limits of short, intensive work efforts. Even under successfully coordinated jurisdictional approaches, a long-term implementation process faces difficult prospects. Direct citizen involvement must necessarily be occasional with focus upon small increments of an overall plan. A lack of continuity in attitude, level of involvement, and perspective toward the overall objectives of the plan can be the risk.

Recommended Strategy

An implementation strategy has been designed to be workable and practical within the circumstances. A plan-based implementation program is recommended which accomplishes both long-term and short-term implementation. The plan should set forth and maintain long-term proposals for the creek corridor including a variety of desirable options which could be presently unobtainable but could prove feasible in the future. The short-term plan implementation process attempts to accomplish the most needed and the most implementable components. The object of this process would be to accomplish projects which are within present limitations, concentrating especially on needed resource improvements, while protecting the option of undertaking other opportunities in the future. Regular review of the two-level plan and current implementation activities with inter-agency coordination is essential to provide continuous fine-tuning and plan update. In its simplest form, the recommended implementation strategy requires the following steps:

1) Adopt the long-term physical plan together with the goals, objectives, policies, and accompanying optional area design as a guide to community and agency decision-making.

2) Implement near-term improvements by taking advantage of the existing project programs and committed planning programs of directly and indirectly related governmental entities while fostering a high level of community involvement in voluntary improvement programs.

3) Phase specific improvements incrementally utilizing procedures of continuing project programming and coordination.

4) Establish an organized plan of intergovernmental coordination with specific implementation responsibilities assigned to key entities according to the level of community service provided by each subarea of the creek corridor.

Ideally, a single entity such as the Midpeninsula Regional Open Space District or the Santa Clara Valley Water District is best suited to assume overall agency responsibilities in administering and maintaining the plan (see Public and Private

Implementation Roles below). Adoption of a single agency implementation approach, or the interagency approach recommended in the upcoming section on Recommended Roles, should be part of this implementation strategy.

Consistent with the above principles of the recommended implementation strategy, an implementation program is set forth below. There are five key elements: 1. Public and Private Implementation Roles; 2. Planning and Project Development Procedures; 3. Project Funding; 4. Regulatory Procedures; and 5. Program Management Requirements.

Public and Private Implementation Roles

The inter-community and inter-agency complexity of the corridor and recommended multi-use plan requires the precise assignment of implementation responsibilities among cooperating entities. No inter-jurisdictional approach, however, can assume a smooth implementation process. Plan implementation responsiveness, accountability, and visibility are inherently improved where a single entity is in charge. Yet of the few entities which have potential corridor-long jurisdictional interests, none appear prepared today to assume overall responsibility.

Santa Clara County, the Midpeninsula Regional Open Space District, and the Santa Clara Valley Water District, are the most likely candidates for a single agency implementation approach. While each has a perspective which cuts across local boundaries, there is no clear-cut, comprehensive authority to assume a "take charge" role.

The County, for instance, provides local services in the unincorporated areas as well as County-wide services. Thus, it is directly responsible for the unincorporated portions of the corridor, especially the baylands, and the intercity aspects of the creek open spaces. Although the trail proposals of the county Trails and Pathways Committee which relate to the creek are taken up by the proposed plan and serve a county-wide interest, many of the recreational attributes of the creek are distinctly local in character, serving in many places only the most immediate adjacent neighborhoods. As a

general purpose governmental body, the county like the city also has many other services competing for its limited revenues.

The Midpeninsula Regional Open Space District, created in 1972 by two-thirds of the electorate of the district, is empowered (like the East Bay Regional Park District) to expend funds to acquire land for open space and recreational purposes to create and maintain recreational facilities. Unlike the East Bay Regional Park District, it is presently organized and directed only to acquire and preserve significant parcels of open space land which it then leases to other agencies to administer and manage for recreational purposes.

The broad powers and character as an open space agency argue for greater consideration of the Regional Open Space District as the ultimate manager of the Stevens Creek Corridor. Its distinct potential managerial advantages even outweigh the propriety issue of dealing with local serving park spaces. Due to the fact that it is nearly entirely financed through property tax revenues, it would take legislative redefinition of its revenue sources and new administrative directives to involve the district in management of recreational and community facilities.

The Santa Clara Valley Water District's interests are corridor-long and current. Although its primary responsibilities are flood and erosion control, its broad enabling legislation does permit the district to engage in the development and maintenance of recreational facilities. A similar example in the Bay Area is the East Bay Municipal Utility District which maintains public access and recreational facilities to its reservoirs and watershed lands with nominal user charges at major entrances. Boating, fishing, picnicking, field play areas and trails are all maintained by EBMUD.

The current policy of the Santa Clara Water District, however, is to permit joint public use of district facilities by other properly empowered public agencies capable of assuming full responsibilty for maintenance and policing of the use. The installation, maintenance and removal of improvements or structures supporting a joint use are at the

cost of a proposing agency; full responsibility for damage insurance claims is also assumed by the proposing agency. Major revision of current policies of the district as requested by the communities of the county would be required to expand the functional scope of the Water District to include comprehensive management responsibilites for the Stevens Creek Corridor.

Recommended Roles

Although many of the above single entity solutions may prove best in the long run and may emerge as a result of legislative enactments supported by the communities of the county, the recommended approach under present circumstances is to organize agency responsibilities according to the service level and jurisdictional view that is logical to each and consistent with the current practice. Recommended governmental implementation roles are displayed in Table 6-1. Roles emphasizing lead, coordinative, and supporting roles are designated in each of the Plan component areas: flood and erosion control, natural resources, recreation, community; Implementation Elements including: planning, financing, project development, regulation, and program management; and subarea responsibilities in each of the seven reaches of the creek corridor.

The Lead Agencies

Because the Water District is the one entity whose present interests are corridor-long, it is recommended that it have lead responsibility in administering the plan over the long term. Although the District only has primary responsibilities in flood, erosion, and natural resource components of the plan, it should be responsible for initiating the continuing planning procedures and administering inter-agency coordination.

The Midpeninsula Regional Open Space District is seen as a catalyst in the implementation of Bayland opportunities because of its established interests along the Bayshore, it should take both a lead and a coordinating role in planning and financing activities.

RECOMMENDED GOVERNMENTAL ROLES

- ● PRIME
- ○ COORDINATING
- ◇ SUPPORTING

	RESPONSIBLE AGENCIES	PLAN COMPONENT: FLOOD & EROSION	NATURAL RESOURCES	RECREATION	COMMUNITY	IMPLEMENTATION ELEMENT: PLANNING	FINANCING	PROJECT DEVELOPMENT	REGULATION	PROGRAM MANAGEMENT	REACH STREAM: REACH 1	REACH 2	REACH 3	REACH 4	REACH 5	REACH 6	REACH 7
LOCAL	SANTA CLARA VALLEY WATER DISTRICT	●	●			●	●	●	○	◉	●	●	●	●	●	●	●
	MID-PENINSULA REGIONAL OPEN SPACE DIST.			○		●	◉										○
	CITY OF MOUNTAIN VIEW	○	●	●	●	◉	●	●	●	●		●	●	●	●	◉	◉
	CITY OF SUNNYVALE		○	○	○	○	◉	◉	◉	◉	●	◉					
	CITY OF LOS ALTOS		○	○	○	◇	◇	◇	◇	◇	●						
	CITY OF CUPERTINO		○	○	○	◇	◇	◇	◇	◇	●						
	SANTA CLARA COUNTY		○	●		○	◉	◉	◉	◉	○	○	○	○			◉
	WHISMAN SCHOOL DISTRICT					○		●		●							
	MOUNTAIN VIEW SCHOOL DISTRICT					○		●		●							
	LOS ALTOS-UNION SCHOOL DISTRICT					○		●		●							
	FREMONT SCHOOL DISTRICT					○		●		●							
STATE	S.F. BAY CONSERVATION & DEVELOP. COMM.					○			○								○
	CAL TRANS		◉				●	●				●	●	●	●		
	DEPARTMENT OF PARKS & RECREATION			◇													
	DEPARTMENT OF FISH & GAME						◇	◇		◇	◇	◇	◇				
	CALIFORNIA CONSERVATION CORPS		◇					◇		◇	◇	◇	◇	◇	◇	◇	◇
	DEPARTMENT OF FORESTRY		◇					◇									
	DEPARTMENT OF WATER RESOURCES			◇			◇	◇									
	DEPARTMENT OF EDUCATION				◇		◇	◇			◇	◇	◇	◇	◇	◇	◇
FEDERAL	DEPARTMENT OF NAVY				●	○		●		○							○
	NASA-AMES				○	○		●		○							○
	USDA SOIL CONSERVATION SERVICE										◇	◇	◇	◇	◇	◇	◇
	DEPT. OF HEALTH, EDUCATION, WELFARE (HEW)										◇	◇	◇	◇	◇	◇	◇
	DEPT. OF HOUSING & URBAN DEVELOP. (HUD)										◇	◇	◇	◇	◇	◇	◇
	HERITAGE CONSERVATION & RECREATION SER.										◇	◇	◇	◇	◇	◇	◇
	U.S. FISH & WILDLIFE SERVICE		◇				◇	◇			◇	◇	◇	◇	◇	◇	
	U.S. ARMY CORPS OF ENGINEERS	◈	○						◇		◇	◇	◇	◇	◇	◇	◇
	PACIFIC GAS & ELECTRIC			◇	◇		◇	○		◉		○	○	○	○	○	○

The City of Mountain View is a primary public landowner throughout the corridor and is responsible for the administration of Shoreline Regional Park. It should have a coordinating role in flood and erosion control activities and a lead role in natural resource, recreation, and community components. The City should share lead responsibilities with the Water District in all planning matters, and assume strong lead responsibilities where recreational community projects are proposed, financed, regulated, and managed, on the adjacent to lands owned or within the jurisdiction of the city. The City has no responsibilities in Reach 1, coordinating or lead role in responsibilities in Reach 2 depending upon the initiatives undertaken by the City of Sunnyvale, lead roles in Reaches 3, 4, 5, and a lead or coordinating role in Reaches 6 and 7.

It is recommended that the county share responsibilities for plan implementation in the Baylands (Reach 7). This will involve coordinating and providing for planning and financing project development, program management of recreational facilities and natural resource improvements in that area. It should be noted, however, that the County Fish and Game Commission should play an important funding role in the implementation of anadromous fish habitat improvements throughout the creek, especially in Reaches 1, 2, and 3 (See Project Funding).

The Coordinating Cities

The Cities of Sunnyvale, Cupertino, and Los Altos have lesser implementing roles because of the limited nature of public use designated for reaches within these jurisdictions. Coordinating roles are required where natural resource recommendations are made; however, the limited public use through recreation and community-related components will relate directly to the City of Sunnyvale. Each city will need to coordinate planning for the creek with its own General and Specific Plans. Sunnyvale should have a coordinating responsibility in financing project development and management of limited public use proposals in Reach 2, while Los Altos and Cupertino should be looked to for supporting roles in these areas in Reach 1.

The Schools

Each of the five school districts should have responsibilities for implementing educational use programs within the natural areas. Coordination of the corridor plan and its objectives should therefore take place between school districts and lead agencies. The districts should assume lead roles in program development of outdoor classroom and nature study programs and major responsibilities in applying for educational program grants, coordinating these with the restoration and use program of areas designated for outdoor study. Long term management responsibilities where natural restoration areas are proposd adjacent to existing schools or included in portions of existing school grounds should also be promoted. Reaches 1, 2, 4, and 5 are primary candidates for direct involvement of the school districts, however, all Reaches are suitable for educational program development.

State Agencies

Of the State and sub-State agencies potentially involved in the Stevens Creek plan, San Francisco Bay Conservation and Development Commission has the most important role in policy making and regulation where Bayland plans are proposed. Close coordination will be required by the lead agencies insuring the compatibility of plan policies with those currently undergoing review and adoption by BCDC.

The State Department of Parks and Recreation is currently financing development of portions of the Baylands Trails, a continuing role of the Department. Special projects like this in the Baylands may be expected in the future, however, broader responsibilities for management of Shoreline Park may be worth considering due to the regional nature of the facility and the broader community it serves.

The Department of Fish and Game should play a supporting role in the anadromous fish habitat program by providing technical assistance and perhaps direct financial assistance. In as much as a nursery fishery rather than an recreational fishery is proposed, it is unlikely that enforcement aspects of the Department would be called

upon. In general, they have concerns in all Reaches of the creek, however, Reaches 1, 2, and 3 should demand primary expertise and support.

The California Conservation Corps (CCC) is perhaps one of the more promising entities with a potential role in the implementation of the creek plan. The Corps (CCC) has been involved in trail and campground development, habitat improvement, fire control, and forest and brush management projects throughout the State. Many of these have been in State Parks and in rural areas. The opportunity to restore vegetation and habitat as part of the Stevens Creek plan, offers the CCC a significant opportunity to become involved in a major urban project. The camp center, located near San Jose, would facilitate CCC involvement. It is recommended that the CCC be solicited to assume a major supporting role in the natural resource program, by providing the manpower and expertise for project development and management. A role in each of the reaches of the creek is possible or their activity could be concentrated on the more wooded portions south of the Bayshore Freeway.

The Department of Forestry could play a supporting role in providing native plant materials for the vegetative and habitat restoration program. Depending upon the availability of grant funds to the Department and the applicability to the Stevens Creek Corridor Plan, the State Department of Water Resources could also play a supporting role in grant financing for recreation portions of the multi-projects recommended for the creek.

Federal Agencies

Of the Federal agencies, the Department of the Navy and the National Aeronautics and Space Administration (NASA-AMES) are directly involved in the Baylands as adjacent property owners. Implementation of project improvements in that area will require continued coordination with these bodies, particularly as to the siting of the Charleston Avenue bridge to provide secondary access into NASA-AMES. The desire to complete a pedestrian way between Whisman School and the Navy Housing Area north

of the Bayshore Freeway as part of the Creek trail plan is one shared by these agencies. As a result, the Navy Public Works Department has volunteered to organize a community work project involving Navy personnel to construct a footbridge which would provide access across Stevens Creek to the proposed West Side Trails as shown in the detailed plans for Reach 6. Continued coordination is required in security matters along the boundaries of the Federal installation agreements for access of entry vehicles and development of adjacent public use areas.

Other Federal agencies offer a wide range of project development grants for which the study area is eligible (see Project Funding). Each is indicated on Table 6-1.

Pacific Gas and Electric Company

Due to the nearly "corridor-long" presence of the PG&E power line right of way, the power company's cooperation is essential to implementation. Under previous agreements with the City of Mountain View (January 31, 1968) the utility company authorized a resolution of permit and consent (#50870) for the Stevens Creek Park Chain giving permission for public entry into its property, right of way, and easements for the purpose of developing, maintaining, and using the Stevens Creek Park Chain. The resolution is subject to several terms and conditions, including: provisions that no trees shall be planted between conductors supported by the same power which will after maturity grow to within 15 feet of the lowest conductor; that the ground to conductor clearance where any grading is performed will not reduce the distance to less than 30 feet; providing for alternate access where park development alters existing access; that the use of the area shall be at the City's sole use and expense and that the City will secure and maintain liability insurance; and other such provisions. Accordingly, a resolution of the City Council (Resolution #7871) enacted March 25, 1968, authorizes the City Manager to execute an agreement with Pacific Gas and Electric Company for the use of their lands in the Stevens Creek Park Chain.

Present corridor studies by the utility to upgrade transmission towers and alignments must be coordinated with use recommendations as will provisions for corridor access.

Concessionaire Roles

In most park programs, program services may often be supplemented by private, profit-making enterprises through the use of lease and operational agreements. This approach may be appropriate in limited areas of the Stevens Creek Corridor. For instance, expansion of the equestrian center (as designated in the plan) may be undertaken through a combination of public and private efforts with concessionaire management.

Because of the undeveloped character of most open spaces however, it is apparent that concessions will have limited application in the foreseeable future. Some exceptions may include options in the El Camino area where more intensive park use similar to activities available in Tilden Park (East Bay Regional Park System) such as an animal farm, a horticultural center or other special activities capable of sustaining user fees. The plan should be flexible to accommodate these opportunities where they may be compatible with the policies and provisions of the plan.

Volunteer and Community Group Roles

Within this framework of public agency roles, a program of community and volunteer group involvement appears feasible on a sustained basis. Park and Recreational Departments and Environmental groups have long used volunteer programs for implementation of local beautification and environmental programs. However, to be successful, these programs require careful coordination, good supervision, and a sense of commitment.

The formation of volunteer groups to replant vegetation and restore the woodlands of the creek, provide for their maintenance, and assist in vegetative erosion control are activities which should be encouraged. Where schools become involved in natural area

improvements and education program developments, Parent Teachers Association efforts should be encouraged. Scouting and community garden groups' involvement in restoration, management, and use of portions of the creek should be actively promoted.

The program has commitments from the San Jose Flycasters Association to provide manpower, materials, and equipment for the implementation of the anadromous fish stream habitat improvement program. This group of dedicated sportsmen have in the past successfully completed similar improvement projects on San Francisquito Creek in Palo Alto, demonstrating its capabilities in carrying out projects of this type.

Depending on the continuity and level of ultimate community interest it may be possible to consider broader management and implementation responsibilities on a neighborhood by neighborhood basis. The "Illinois Prairie Path" program is an example of a corridor trail program supervised, maintained, and owned by a community based non-profit corporation. Under this program, neighborhoods, community groups, and civic associations such as service clubs, The Audubon Society, schools, and similar groups assume the responsibility for adopting and maintaining segments of the corridor through individual resources. Representatives of each serve as members of a board of directors for the entire facility. Strict regulations regarding the use of non-motorized vehicles, fire arms, and recreational uses are enforced; in addition, the organization provides for interpretive nature tours, publications, and other recreational uses.

Although a determined local effort would be needed to initiate a "Illinois Prairie Path" type approach to management of the Stevens Creek Corridor, it is one which may hold promise in future years.

Planning and Project Development Procedures

The need to provide for a continuing, long-term implementation process challenges the use of conventional implementation tools. A drawn-out implementation process is vulnerable to the ebb and flow of financing and managerial capabilities. Where gaps between long-term objectives and short-term implementation resources appear,

even worthwhile projects may often be abandoned. The planning procedures proposed herein have been designed to address these difficulties by providing for systematic phasing in a manner consistent with the long-term pattern and goals of the plan.

Consequently, a three part system of implementation procedures is proposd to implement the plan and the project. The components interrelate in such a way as to insure systematic definition of long-term objectives within short-term program decisions. They include: a Long-Term Plan and its individual components; a Five-Year Phasing Program containing specific elements; and an Annual Program Review and Update with its own specific procedures.

In broad terms, the Long-Term Plan provides the overall statement of purpose and guiding direction for all decision making. The Five-Year Phasing Program addresses the implementation of selected pieces and projects of the plan according to a what is "do-able" within the current time frame, yet makes possible the achievement of future components. The Annual Review and Update program keeps the implementation process current and provides the year-to-year consistency of inter-agency and program actions. Each of these components is discussed in detail below.

The Long-Term Plan

It is envisioned that the plan for the creek corridor embody the recommendations and plan components set forth in this report. When adopted by the member agencies to the plan, it represents the guiding statement of use, development, and management policies shared by the various jurisdictions. There are three components as follows:

1. Goals and Policies Framework. The recommended goals and policies summarized in Chapter 3, as refined and ultimately adopted by the member agencies, are intended to direct the plan and the implementation process over the long term. The broad goals and more specific objectives provide both general and measurable Statements of purpose and direction. The policies are designed to carry those out and will, as time goes on, undoubtedly require refinement, deletions, and redefinitions. This process

should be coordinated by member agencies and new policies incorporated into the adoption process of each. Planning analysis and program data supporting the goals and policies framework are provided by Chapter 4 of this report.

2. Physical Plan. The plan diagrams and drawings set forth in Chapter 5 of this report identify uses and diagram their physical arrangement within each of the reaches of the creek corridor. The plan is set forth at two levels. The first, represented by each of the reach diagrams, presents the baseline plan showing the areas where resource restoration and changes should be made and the uses to which they may be put based upon foreseeable possibilities of achieving the plan. At the second level, optional plan developments are presented which offer exciting opportunities possibly unattainable now, yet which hold promise for future consideration. Some of these options, such as in the Bayshore, maybe possible in the near future but will require community deliberation and agreement as to objectives and means. Others, such as the possibilities in the El Camino Real area for a new district-level open space park, are seen as longer-term possibilities, dependent upon major land use changes and future community desires.

3. Implementation Contingencies and Key Decisions Framework. A detailed tabulation of contingencies and key decisions should be prepared as part of the intial implementation steps of the plan based on many of the program interrelationships identified in this report. All aspects of the plan and related projects should be listed and systematically linked according to a trial phasing schedule which includes the contingencies upon which each project is based and the key decisions which will be needed to implement each aspect of the program. The lead time needed to implement any set of options would be identified along with such factors as necesary planning, available capital funding, status of public assistance programs, regulatory requirements, and the like. The long-term phasing guide should be illustrative and represent a desirable course of phasing future projects.

Five-Year Phasing Program

The Five-Year Phasing Program is the heart of the implementation process. It is intended to formulate the specific strategy by which each of the increments of the plan are to be developed. As time goes on, it would also fine-tune and update the plan, insuring that objectives and policies are current and are in-tune with community needs and desires. It is also the basis for reassessing agency agreements and involvements. The Five-Year Phasing Program should include the following elements and procedures:

1. Selection of Priority Projects. Based upon the frame of reference provided by the long-term plan and its elements, the phasing of projects as illustrated in the phasing guide should be reviewed against the interests and needs statements of member agencies provided by the Projects Needs Survey and Funding Program (see below). The Five-Year Phasing Schedule identifies the means by which each element is to be implemented and the critical steps in the implementation process.

2. Project Needs Survey. A supporting activity which determines the direction of the phasing plan is achieved through a built-in survey of public needs and desires within the surrounding communities of the corridor and a pool of agency views relating to capabilities and other considerations. The special studies of this fund are normally performed by local cities to assess user recreational needs. These user surveys should be performed on a systematic basis as part of the plan refinement process to insure that uses designated in the plan continue to be relevant to citizen perceptions of their outdoor recreational needs. The procedures provide a means of focusing on priorities which should be implemented in current phases.

3. Annual Program Review and Update. An annual review process should be initiated to be conducted by the lead agency on a yearly basis in a manner benefiting the normal departmental program-budgeting process of agency departments and maintaining the plan implementation process on a regular basis. This process should be undertaken as a normal interagency referral procedure through a format which provides for reporting

on the progress of a Five-Year Growth Phasing Program, solicits recommendations for changing both the Five-Year Growth Phasing Program and components of the long-term plan, and identifies new opportunities in funding or agency actions which may benefit the plan. Based on this review, actions should be initiated to update the components of the implementation program and provisions made for the decisions required of governing bodies during the upcoming program year.

Project Funding

Determination of an implementation funding program is not a simple matter of who pays for what. Under the present crisis of reduced fiscal resources, even established priorities and funding approaches need re-examination. In the face of the present uncertainties, it is essential to identify all potential revenue sources, assess the trends which affect funding viability in the future, and provide a method for linking the potential sources of funds to the planning and project development process. It is intended, therefore, that the inventory of potential funding sources which appears in this section be continually updated and appraised as part of the implementation process.

Due to the comprehensive nature of Stevens Creek Plan, its relevance to Federal and State urban quality objectives, the plan appears to be eligible for a wide range of assistance funds. Importantly, the plan appears consistent with long-term trends in funding priorities. The possibilities for project financial support represent a complex web of monies, a little from here, a little from there, to form a network of State and Federal grants and local matching funds. Creative, persistent initiatives will be required of lead agencies if the varying sources are to be made useful to the purposes of the plan.

Local, State, and Federal funding sources are outlined below to be used as a guide to the types of money available and the potential range of existing sources. The content of each program may certainly be expected to change from year to year, as will the commitment of funding. Although local funds are likely to be reduced for the foreseeable future, trends at especially the national level suggest increasing support for projects of the type the corridor plan represents.

Close-to-home urban recreation opportunities as provided by the Stevens Creek Corridor Plan are currently being stressed in the development of the NATIONAL URBAN POLICY and the NATIONAL RECREATION POLICY. The latter will be included in the NATIONWIDE PLAN FOR RECREATION delivered to Congress in December1978. Many of the present difficulties or limitations in the Federal programs, especially the lack of funds for continuing management once a project is built, are recognized as weaknesses in the Federal grants program.

Assessments and recommendations being made as part of the policy development process include recommendations for: changing the Land and Water Conservation Fund to address high priority urban recreation needs; modification of the community development Block Grant Program to improve local park and recreation systems to meet acceptable standards; promoting joint use of schools, community centers and private facilities as part of the community and recreation resources system; improvement of accessibility to recreation opportunities, and promoting environmental education and management as an integral part of urban park and recreation programs.

Local Sources

Problems associated with local funding sources for improved implementation of the Stevens Creek Corridor Plan have already been discussed. The Jarvis-Gann Initiative basically set a defacto maximum combined property tax rate for all agencies. However, local general funds have been the traditional source of money supporting projects such as open space improvements, provision of bicycle trail, park development, and the like in the past; even then, available local funds have often been supplemented by special purpose funds. It may thus be unrealistic to consider General Fund availability for Plan projects in the conceivable future.

The funding capabilities of the Water District for implementing flood control and erosion improvements is similarly undercut. Stevens Creek lies in the Northwest Flood Control Zone, one of five such Zones in Santa Clara County. Each zone had a separate

tax generation rate based on property tax assessments. For the Northwest Zone, the 1977-78 rate was $0.143 per $100 of assessed valuation. Together with interests in other miscellaneous revenues, the zone's annual budget was 2.1 million. Since the passage of Proposition 13, the projected annual revenue for this zone is 1.17 million, nearly 1 million dollars less than the previous year. Thus it is not clear at present how the District will finance urgently needed flood control and erosion projects. All project priorities are currently undergoing thorough reevaluation by the District.

These reduced financial capabilities can also affect the nature of the projects implemented. Recreational environmental projects are proposed in many instances to be integrated with required engineering projects. In some instances they represent necessary mitigation of an adverse impact of a proposed project. For example, where a proposed project may reduce the potential for upstream anadromous fish migration, fish ladders or similar devices should be provided. In other instances, an expansion of the basic engineering program is proposed as a way of achieving added recreational and environmental benefits beyond those which can be achieved by solutions which solve simply a flooding problem. Although it may be more cost-effecient to provide multiple benefits in constructing a facility, the multi-use project may represent an added cost over a single purposed project. From the standpoint of the Water District, it becomes increasingly difficult to assume added multi-use costs other than those required for project mitigation without identification of new approaches to cost sharing or funding assistance.

State Funding Sources

The following grant programs administered by various State agencies are currently employed to implement planning projects of the type recommended by the Plan. Some, as the Trail Improvement Program (SP-503), are currently being developed for Stevens Creek; others are employed throughout the State although renewed funding may be required. All should be monitored regularly and sought for Stevens Creek projects.

Priority Recreational Trail, California Recreational Trials Act (Senate Bill #503).

This amendment to the Recreational Trail Act, 1977, provides for appropriation of expenditures from the Park and Recreation Revolving Account in the General Fund to provide for the planning, acquisition, and development of recreational trails in specified corridors throughout the State on a priority basis. Of the total $2,700,000 allocated, $400,000 has been assigned to the development of Bayfront trail, Although the trail program is currently being prepared by the State Department of Parks and Recreation, it is intended that an inboard trail connecting the Palo Alto Baylands with the San Francisco National Wildlife Refuge be developed. At present, the program is considering financing development of crossing and stopover points. Realignment of the Crittenden Bridge as proposed in the Plan to link the inboard trail would have a high eligibility for funding because it implements the trail system and connects two public recreational lands (Shoreline Park to Midpeninsula Marsh Preserve). It is also feasible that appurtenant facilities such as viewing platforms could be included in the facility design and development.

Final implementation of the trail hinges on negotiations with Leslie Salt Company relating to the public access easements and agreements with a local entity to assume management. In this situation the State requires firm agreements that the use will be primarily for public recreation and that the State will retain a lead authority over the specific use. However, the State expects the county to assume responsibility for operation and maintenance costs as well as insurance liability. Finalization of the trail plans awaits the final coordination with the recommendations of the Stevens Creek Plan and the negotiation of agreements.

Robert - Z'Berg Urban Open Space and Recreational Program Act State Department of Parks and Recreation.

This is an annual $25 million program that provides grants to cities, counties, recreation and park districts, and regional park districts for acquisition and development

of parks and recreation areas in heavily populated areas of the State. Since emphasis is on the recreational needs of urban residents, active pursuit of funds should originate from within or adjacent to densely populated communities and should be directed toward unmet needs. Demonstrated public need and support are among the evaluation criteria for funding.

Projects may include acquisition, development, rehabilitation, land addition, expansion of facilities, or joint agency projects. The State provides 75 percent and requires a 25 percent local match for allowable costs. There are two types of funding available: block grants and need basis grants. The former are allocated on a per capita basis; the latter are competed for statewide and project-by-project.

Environmental Education Grant Program. State Department of Education.

Community-centered and school environmental education programs are eligible for 50 percent grants; local match may be in cash or services. Applicants must be public agencies.

Monies may be used for teaching materials and training, development of facilities and improvements, and internship programs. Capital outlay is, however, limited to small amounts.

Nejedly - Hart State Urban and Coastal Park Bond Act of 1976. State Department of Parks and Recreation.

This bond act provided for the issuance and sale of $280 million worth of bonds of which #85 million was made available for 100 percent grants to local governments - cities, counties, and districts other than school districts. Funds are allocated to counties based on population and are encumbered for three years. Santa Clara County received the second highest allocation (after Los Angeles): $4,468,523.

Monies can be used for the acquisition, development, or restoration of real property for park, beach, recreational, and historical preservation purposes. Counties must develop and submit to the State a priority plan of expenditure. Once adopted, this plan cannot legally be changed.

Z'Berg - Collier State Beach, Park, Recreational and Historical Facilities State Department of Parks and Recreation.

This 1974 bond act authorized the issuance and sale of $250 million worth of bonds for the acquisition and development of needed outdoor recreation and historical areas. Of this sum, $90 million was allocated for 100 percent grants to counties and other agencies of local government. Grants are based on population but with no county to receive an allocation of less than $200,000.

A priority plan for expenditure of the total county allocation is required. Each project must be in accord with the "California Outdoor Recreation Resources Plan".

Wildlife Conservation Act of 1947. State Wildlife Conservation Board (under jurisdiction of State Department of Fish and Game).

This act provides funding for the acquisition and/or development of lands suitable for the preservation of wildlife habitat, both land and water, or lands that offer significant hunting or fishing recreational opportunities. Companion legislation created the Wildlife Restoration Fund through which monies are disbursed to cities, counties, special districts, or other local jurisdictions. Since this fund is for capital outlays, the applicant must guarantee operation and maintenance.

There is a continuing appropriation to the fund of $750,000 per year from the proceeds of pari-mutuel betting. This money is used primarily for the development of such facilities as interpretive study areas, fishing peirs, viewing areas, and other forms of passive recreation. In the 1974 Recreation Bond Act, 10 million dollars was appropriated to the Board for acquisition purposes: in the 1976 Urban Coastal Bond Act 15 million dollars was appropriated - 10 million dollars for acquisition in the coastal zone and 5 million dollars in the interior. In addition, the Board actively applies for matching grants from the Federal Land and Water Conservation Fund.

Bicycle and Pedestrian Facilities (SB 821): State Department of Transportation.

The Transportation Development Act of 1972 (SB 325), which also derives its

revenues from the State gas tax, provides funds for local transportation purposes. SB 821 provides that two percent of these funds may be used for pedestrian and bicycle facilities. Approximately $3 million annually is available on a statewide basis. However, since the funds are administered by regional transportation planning agencies (in this instance the Metropolitan Transportation Commission (MTC), at their prerogative the money can be spent for transit projects of higher priority.

Davis - Grunsky Act. State Department of Water Resources.

This act provides loans and grants to local water agencies for recreation, fisheries, and wildlife aspects of multi-purpose projects. Grants are allocated only to the recreation portions of a project.

California State Legislature, State Transportation Fund, Bicycle Land Account - Local (SB 244). (also known as the California Bikeways Act):

This fund requires that $30,000 per month ($360,000 per year) of the local government share of State gas tax revenues be deposited in the Bicycle Lane Account. The monies are allowed to accumulate.

Grants are oriented toward Class 1 bikeways, paths that are separated from roadways and are exclusively for bicycle and pedestrian use. On-street bicycle lanes are not eligible for funding. The intent of the program is to encourage the development of coordinated bikeway system oriented toward commuter use as an alternative mode of transportation.

Funds may be used for preliminary and construction engineering, right of way acquisition, and construction costs. CALTRANS supplies 90 percent of the funding; there is a ten percent local match requirement. The fund is negligible but a single jurisdiction can receive up to 25 percent of the total amount.

Federal Funding Program.

A wide array of federal programs are directly relevant to the Stevens Creek Program. Many are not widely known and have been given little attention by

grant-seeking agencies. Others such as The Land and Water Conservation Fund, which is in use throughout the country, is presently being used in the corridor for acquisition of marshlands in the bayshore area. Others appear to be evolving toward greater support for projects such as Stevens Creek represents. The following should be reviewed and continually investigated for future applications.

Land and Water Conservation Fund Grants (CFDA #15.400)* Heritage Conservation and Recreation Service, Department of the Interior

Acquisition and development grants are available for a wide range of outdoor recreation projects such as picnic areas, inner city parks, bike trails, campgrounds, and support facilities such as roads, water supply, etc. Facilities must be open to the general public. Monies are not available for operation and maintenance and must be assumed by a sponsoring agency. Priority is given to projects which serve urban populations. Not more than 50 percent of the project costs may be federally financed except under conditions where all or part of the sponsor's matching share is derived from another Federal program such as Title 1 Community Development.

Authorized for 25 years, this program became effective in 1965. Monies may be used for statewide planning, acquisition, and development of outdoor areas and facilities. Since it is a reimbursement fund, requesting agencies are expected to finance 100 percent of a project; 50 percent of actual expenditure is refunded upon completion.

*Catalogue of Federal Domestic Number

Federal Aid Highway Program (CFDA #20.205) Federal Highway Administration, Department of Transportation

Funds may be used for various highway-related activities including bridges, bikeways, pedestrian walkways, bridge and corridor parking facilities, and rest areas. Although the State Highway Agency is the basic applicant, certain projects in urban areas may be proposed by counties or other political subdivisions through the highway department. Normal Federal share is 70 percent, and some projects require no State match.

Within limits, the Federal Aid Highway Acts of 1973 and 1976 allows financing construction of bikeway and pedestrian facilities as independent projects i.e. not necessarily in conjunction with highway projects. The limit for this diversion is $45 million nationwide and $2.5 million within any state. Certain criteria for safety, overall plans, maintenance, vehicle use, and cost-effectiveness must be demonstrated.

Watershed Protection and Flood Prevention (CFDA #10.904) (Small watershed or Pl-566 Program), Soil Conservation Service, Department of Agriculture

Provides project grants and advisory services to plan, design, and install watershed improvement works and to share costs of flood prevention, irrigation, drainage, sedimentation control, and public water-based fish and wildlife and recreation. The watershed must not exceed 250,000 acres and the improvements must not exceed $5 million. All types of costs are eligible for loans, but the amount of Federal grant awards differs on various aspects of the total project.

Stevens Creek is already under consideration for this program: it meets the project criteria and is considered a good project by the State Soil Conservation Service. However, Congress has become concerned that a program intended for rural purposes not be diverted to projects that are more than 50 percent urban. Deliberations are presently underway in Washington, D. C.

Environmental Education (CFDA #13.522). Office of Education, Department of Health, Education, and Welfare

Project grants are earmarked to support the development of educational processes dealing with man's relationship with his natural and manmade surroundings, including such activities as 1) development of curriculum materials, 2) training for educational and non-educational personnel, 3) community education projects, and 4) elementary and secondary education projects. Although educational agencies are the usual applicants, grant awards may be made to a variety of non-profit groups. Some projects are eligible for 100 percent funding, others for 80 percent for the first year.

Community Development Block Grants/Entitlement Grants (CFDA #14.218). Community Planning and Development, Department of Housing and Urban Development

The Block Grant Program consolidates several categorical programs: urban renewal, model cities, neighborhood facilities, open space lands, historical preservation, urban beautification, basic water and sewer facilities program, public facilities loans and rehabilitation loans. Cities in SMSAs with populations in excess of 50,000 and localities which receive funds determined by a statutory formula. There is no matching requirement.

U.S. Fish and Wildlife Service. Department of the Interior

This department administers several programs that may prove of interest in the future development of Stevens Creek. Most are coordinated through the State Department of Fish and Game (?). They are briefly described below.

Anadromous Fish Conservation (CFDA #15.600)

Objective: To conserve, develop, and enhance the anadromous fish resources of the nation. Project grants include planning, inventory, research, supplements to natural production, fish passage and guidance facilities, and habitat improvement projects.

Fish Restoration (Dingell-Johnson Program)(CFDA #15.605)

Objective: To support projects with formula grants designed to restore and manage sport fish populations for the preservation and improvement of sport fishing and related uses of these fisheries resources. Appropriate activities include land acquisition, development, research, and coordination, not land enforcement.

Sport Fish Technical Assistance (CFDA #15.608)

Objective: To provide technical assistance and information in the management of waters for sport fishing. One of the management tools considered is stocking of fishes from National Fish Hatcheries. No financial assistance is available for construction.

Wildlife Restoration (Pittman-Robertson Program)(CFDA #15.611)

Objective: To support projects to restore or manage wildlife populations and the provision of public use of these resources. That use is primarily hunting. In recent years, application of this fund to wildlife preservation of other than hunting species has been successful and the program may then be applicable to the goals of marshland preservation.

National Environmental Study Areas and National Environmental Education Development Programs (NESA) and (NEED). National Park Service, Department of the Interior

The NESA program consists of a network of environmental educational sites, some in national parks, others strictly local, but all recognized as part of a nationwide Federal system. All have ongoing environmental education programs developed by the local sponsor.

After the development of an environmental education site and a year or two of a successful program, an agency can apply for Federal recognition as a NESA site of the National Park Service. The value of this designation lies in "legitimizing" a site as part of the national system to attract other types of monies. NESA itself carries no financial assistance.

NEED offers a set of environmental education curriculum materials developed by the National Park Service in conjunction with the National Education Association. They are designed for different age and grade levels and are not site-specific. Their advantage is that a local agency need not develop its own program.

Highway Landscape Restoration Program. Landscape Architecture Division, CALTRANS

CALTRANS maintains a basic maintenance program referred to as "highway restoration". It involves yearly inventory and replacement of diseased, damaged or dead plant materials within a freeway right of way. It may also involve upgrading a manual

irrigation system to an automatic one. These kinds of concerns can be brought to the Department's attention by a local agency.

Some ten years ago, CALTRANS coordinated their plantings along the Stevens Creek Expressway where the road adjoins Stevens Creek with the City of Mountain View in order to mirror the type of natural area planting the City wished to maintain. The Department currently considers the stretch of Highway 85 from Highway 101 to Fremont Avenue completed although consideration is underway for upgrading the irrigation system. Plans are also under consideration to widen Highway 85 to six lanes utilizing the median right of way. The Department maintains a seedling planting service in their right of way that is detailed under State Forest Service.

Nursery Program. State Department of Forestry, 5800 Chiles Road, Davis 95616

California maintains a self-supporting seedling program that is available to anyone, including individuals, provided certain legal requirements are met. These mandate that the plants be used only for such purposes as erosion control, reforestation, or windbreakers, and not for beautification.

The State maintains three nurseries and sells some six to seven million seedlings per year. These are both bare-root and in containers; all are trees, primarily conifers. At the Ben Lomond nursery, closest to Stevens Creek, primarily coastal species such as Coast Redwood, Monterey Pine, and Douglas Fir are grown. Minimum purchases are 500 for bare-root stock and 100 units for container. Prices are minimal; e.g., 500 two year old coast redwood would cost approximately $32. Delivery is available for a charge.

Regulatory Procedures

Although Plan recommendations largely relate to public lands rather than private, the implementation program will require use of local regulatory powers. This section identifies regulatory needs ranging from the type of agency agreements which should be adopted by the lead agencies, the role of the General Plan adoption process, development review responsibilities, open space zoning provisions, and the potential uses of the specific plan technique. Each of these is described below.

Inter-Agency Agreements

Each of the lead agencies should execute agreements governing assignment of responsibilities and areas of cooperation in the implementation program. Although several types of formal arrangements are possible such as Joint Planning Committees or Area Planning Commissions, a simplified interagency form of agreement is recommended.

Agreements should specify responsibilities for administering the policies of the plan and for coordinating aspects of the plan and project development procedures. Where lead agencies will be expected to execute additional agreements with civic groups, such as the recommended Land Management Understanding with Scouting and similar groups, they should be exercised by the entity having direct jurisdiction and coordinated with the other lead agencies.

Development Review

Local government development review of private projects adjacent to the creek for land use conversion, facility expansion, or new development will continue to follow normal interagency referral procedures where concerns of several jurisdictions are found. An important function of the Water District in the past has been to administer building setbacks from the creek through the administration of the Geologic Hazard Setback Line Policy of the plan and have final responsibility for interpretation of specific setback distances. However, where minor projects are involved such as building permits for additions to single family homes or where definitive location of the Geologic Hazard Setback Line is not needed, "one-step" processing may be permitted based on map delineations of the Geologic Hazard Setback Line. The district may then delegate the findings of lesser concern in these areas to the local agency and reduce processing time.

Where projects are proposed at the boundaries of the open space land which affect either future open space development options or desirable public access, project design review should be employed to achieve improved project plans compatible with open space objectives in that area.

General Plan and Specific Plan Procedures

Amendments to the local general plans of the City of Mountain View in the Santa Clara County as well as the supporting cities, incorporating the goals and policies of the Stevens Creek Plan into the open space and conservation elements of each is required to insure the long-term implementatoin of the plan.

This adoption process should be one of the initial priorities of the implementation program, however, the formal amendment process may be expected to be included in the yearly general plan update and procedure as provided for by State law.

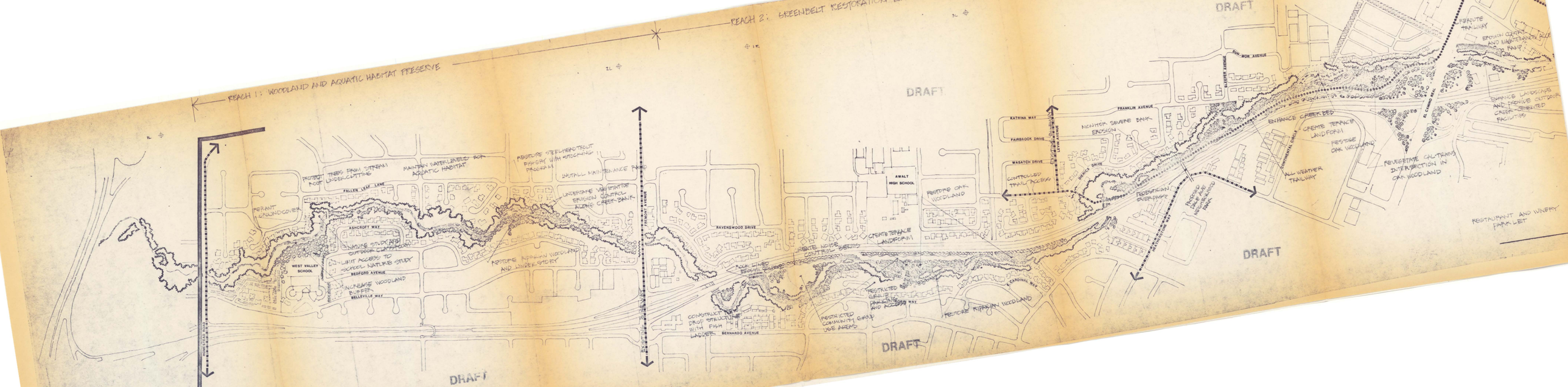
The California governmental code permits preparation of specific plans which serve to regulate site development and may be useful where the expanded open space parkland proposals in the El Camino area would effect new private development in that area. Assuming that land conversion and more intensive development occurs sometime in the future in this zone, it would be appropriate to use the specific plan tool as a means of providing the optimum physical layout, road circulation and access, private development orientation, and parkland layout in this area.

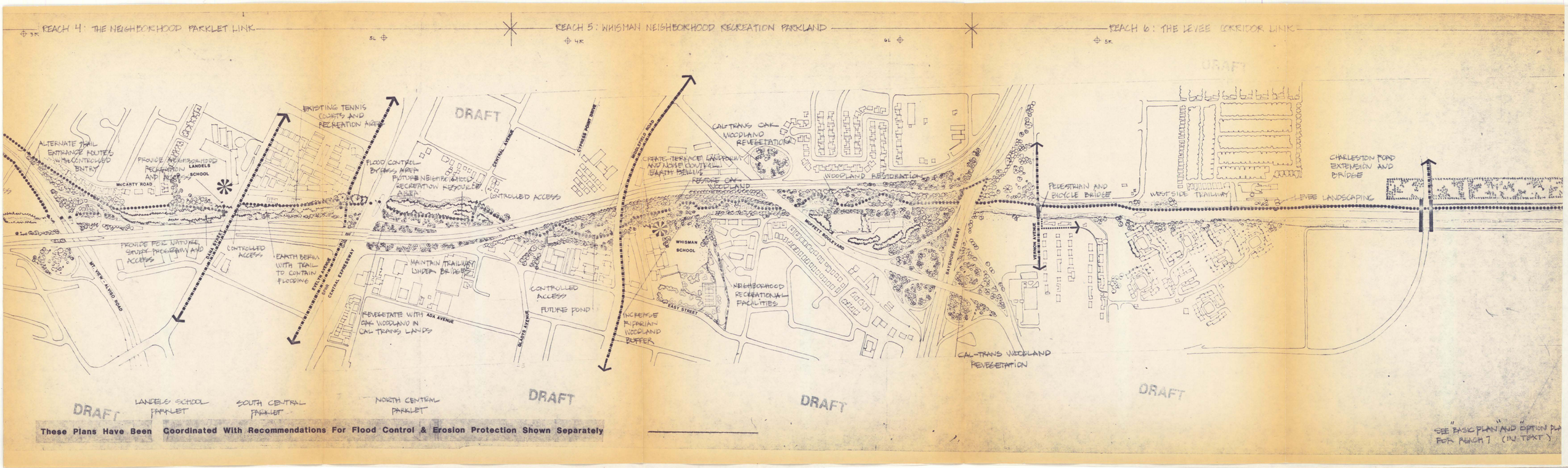
Open Space and Conservation Zoning

Two requirements of State law affect the regulatory status of open space lands within the Stevens Creek corridor: the requirement that the local zoning ordinance be consistent with the general plan and the requirement that cities and counties prepare and adopt open space zoning ordinances consistent with the required open space plans. With the adoption of the objectives and policies of the Stevens Creek Plan in the general plan of local governments and the designation of the corridor lands as open space, it is appropriate to follow through the regulatory process with appropriate zoning designations.

Within the City of Mountain View, an ordinance amending the zoning map of the city relative to the Stevens Creek Park Chain (June 13, 1977, Ordinance #39.77) undertook the re-zoning of lands from single family residential and multi-family

residential districts within the creek area to the P. F., Public Facility District. Elsewhere within the Stevens Creek Plan area, where existing zoning is found to be inconsistent or "incompatible" with open space use, similar re-zoning should be undertaken to comply with State law.


REACH 1: WOODLAND AND AQUATIC HABITAT PRESERVE
REACH 2: GREENBELT RESTORATION
DRAFT
DRAFT
DRAFT
DRAFT
PROTECT TREES FROM STREAM ROOT UNDERCUTTING
MAINTAIN WATERLEVELS FOR AQUATIC HABITAT
RESTORE STEELHEAD TROUT FISHERY WITH STOCKING PROGRAM
INSTALL MAINTENANCE PATH
UNDERTAKE VEGETATIVE EROSION CONTROL ALONG CREEK BANK
PERENNIAL GROUNDCOVER
FALLEN LEAF LANE
ASHCROFT WAY
WEST VALLEY SCHOOL
HOUSE STUDY AND OUTDOOR CLASSROOM
LIMIT ACCESS TO SCHOOL NATURE STUDY
BEDFORD AVENUE
INCREASE WOODLAND BUFFER
BELLEVILLE WAY
RESTORE RIPARIAN WOODLAND AND UNDERSTORY
RAVENSWOOD DRIVE
CONSTRUCT LINE DROP STRUCTURE WITH FISH LADDER
BERNARDO AVENUE
AWALT HIGH SCHOOL
RESTORE OAK WOODLAND
CREATE TERRACE LANDFORM
REDUCE NOISE CONTROL BERMS
RESTRICTED PARKING AND ACCESS
RESTRICTED COMMUNITY GARDEN USE AREAS
RESTORE RIPARIAN WOODLAND
E. CARDINAL WAY
KATHINA WAY
FAIRBROOK DRIVE
WASATCH DRIVE
CONTROLLED TRAIL ACCESS
MONITOR SEVERE BANK EROSION
FRANKLIN AVENUE
PEDESTRIAN OVERPASS
PROPOSED BIKE ACCESS NATURE PATH
ENTRANCE CREEK BED
CREATE TERRACE LANDFORM
RESTORE OAK WOODLAND
ALL WEATHER TRAILWAY
REVEGETATE CULTURAL INTERSECTION IN OAK WOODLAND
PERMEABLE TRAILWAY
EROSION CONTROL AND MAINTENANCE ACCESS RAMP
ENHANCE LANDSCAPE AND PROVIDE OUTDOOR GREEN DEVELOPED FACILITIES
RESTAURANT AND WINERY FARM LET


REACH 4: THE NEIGHBORHOOD PARKLET LINK
REACH 5: WHISMAN NEIGHBORHOOD RECREATION PARKLAND
REACH 6: THE LEVEE CORRIDOR LINK
3R
5L
4R
6L
5R
DRAFT
ALTERNATE TRAIL ENTRANCE ROUTES WITH CONTROLLED ENTRY
PROVIDE NEIGHBORHOOD RECREATION AND PLAYGROUND
LANDELS SCHOOL
McCARTY ROAD
PROVIDE FOR NATURE STUDY PROGRAM AND ACCESS
MT. VIEW - ALVISO ROAD
SINA STREET
CONTROLLED ACCESS
EARTH BERM WITH TRAIL TO CONTAIN FLOODING
EVELYN AVENUE
STATE HIGHWAY 237
CENTRAL EXPRESSWAY
EXISTING TENNIS COURTS AND RECREATION AREA
FLOOD CONTROL BYPASS AREA
FUTURE NEIGHBORHOOD RECREATION RESOURCE AREA
CENTRAL AVENUE
CONTROLLED ACCESS
MAINTAIN TRAILWAY UNDER BRIDGE
REVEGETATE WITH OAK WOODLAND IN CAL TRANS LANDS
ADA AVENUE
GLADYS AVENUE
CONTROLLED ACCESS
FUTURE POND
CYPRESS POINT DRIVE
LANDELS SCHOOL PARKLET
SOUTH CENTRAL PARKLET
NORTH CENTRAL PARKLET
These Plans Have Been Coordinated With Recommendations For Flood Control & Erosion Protection Shown Separately
BIRCHFIELD ROAD
CREATE TERRACE LANDFORM AND NOISE CONTROL EARTH BERME
RESTORE OAK WOODLAND
CALTRANS OAK WOODLAND REVEGETATION
WOODLAND RESTORATION
WHISMAN SCHOOL
EAST STREET
NEIGHBORHOOD RECREATIONAL FACILITIES
INCREASE RIPARIAN WOODLAND BUFFER
McFETT BOULEVARD
BAYSHORE FREEWAY
CAL-TRANS WOODLAND REVEGETATION
VERNON AVENUE
PEDESTRIAN AND BICYCLE BRIDGE
WEST SIDE TRAILWAY
LEVEE LANDSCAPING
CHARLESTON ROAD EXTENSION AND BRIDGE
SEE "BASIC PLAN" AND "OPTION PLA
FOR REACH 7 (IN TEXT)